LETTER OF TRANSMITTAL

TCF Architecture

To: **City of Wenatchee**
Community Development
1350 McKittrick Street
Wenatchee, WA

Attention: **Mr. Glen DeVries**

Date: 10/20/2014

From: Terry Bills

Project Name: WES/ECLC

Project Number: 2014-001

Copies to: File

We are sending you: ☐ Attached ☑ via UPS - Ground ☐ Will Call
☐ via U.S. Mail ☐ Hand Deliver

Items Transmitted:

Qty.	Item	Dated	Pages
3	Full Size Conditional Use Permit Drawings	2014	
1	½ Size Conditional Use Permit Drawing		
1	CUP Application		

Transmitted as checked:

☐ For review and comment
☐ Exhibit 'A' for your records
☑ For your use
☐ For approval
☐ Reviewed as noted
☐ Revise and Resubmit
☐ Returned after loan to us
☐ As requested
☐ Architect Consultant Agreement for your review, signature, & return to TCF

Comments / Action:

For your use

Katherine Shelton
for

Terry Bills

TCF Architecture, PLLC
902 North Second Street Tacoma, Washington 98403 P.253.572.3993 F.253.572.1445 www.tcfarchitecture.com

TCF Architecture

October 17, 2014

City of Wenatchee
Community Development

Mr. Glen DeVries
1350 McKittrick Street
Wenatchee, WA

Re: Conditional Use Permit Application
Wenatchee School District 246
Washington Elementary School Replacement
& Early Childhood Learning Center Renovation

Dear Glen,

Please find attached the documents for our Conditional Use Permit submittal for the Washington School District Projects – Washington Elementary School Replacement and the Early Childhood Learning Center Renovation.

General Information:

Site Address: 1401 Washington Street,
Wenatchee, WA 98801
Parcel No.: 22209210500
Owner: Wenatchee School District 246
235 Sunset Ave
Wenatchee, WA 98801
Owner's Representative:
Wenatchee School District 246
Bryan Vissher, Director of Facilities and Risk Management
1001 Circle Street
Wenatchee, WA 98801
Ph: 509-663-0555
Applicant's Representative:
TCF Architecture
902 Second Avenue
Tacoma, WA 98403
Terrence T. Bills, Project Architect
Ph: 253-572-3993
Contact: **Hill International**
818 W. Riverside Avenue Suite 350
Spokane, Washington 99201
Pat McCord
Project Manager
Mobile: (509) 499-6499

Attachments: Letter of Transmittal
Conditional Use Permit Application
City of Wenatchee, Pre-Development meeting minutes, dated July 10, 2014
Vicinity Map – Ac1.01
Legal Description – Ac1.02
Fire Flow Analysis – RH2 Letter, dated October 8, 2014
Modulation Narrative, TCF Letter, dated October 17, 2014
Detailed Project Description – Washington Elementary School Basis of Design
Detailed Project Description – Early Childhood Learning Center Basis of Design
AutoTurn Analysis – RH2 Technical Memorandum, dated October 7, 2014
SEPA Checklist – *To be submitted via separate cover by October 22, 2014*
Drawings – 11 x 17, 43 drawings

Please let me know if there is anything else you need in review of the Conditional Use Permit application.

Respectfully,
TCF Architecture

Terrence T. Bills
Project Architect

cc: File
Bryan Visscher, WSD
Patrick McCord, Hill International

CITY OF WENATCHEE
DEPARTMENT OF COMMUNITY DEVELOPMENT
PLANNING DIVISION

1350 MCKITTRICK STREET, SUITE A
PO BOX 519, WENATCHEE, WA 98807-0519
(509) 888-3200 FAX (509) 888-3201
www.wenatcheewa.gov

CONDITIONAL USE PERMIT APPLICATION

FILING FEES: $ 950 Application Fee — FILE # _____
$ 450 for Home Occupation or Temporary Parking Facility
$ 200 Public Works Review (not required for home occupations or temporary parking facilities)
$ 100 Landscaping Plan and Inspection (if applicable)

DATE STAMPED_____ FEE_____ CHECK # _____ RCPT#_____

APPLICANT/CONTACT Wenatchee School District No. 246 Bryan Visscher, Director of Facilities and Risk Management PHONE 509-663-0555

ADDRESS 1001 Circle Street, Wenatchee, WA 98801 EMAIL visscher.b@wenatcheeschools.org

APPLICANT'S REPRESENTATIVE TCF Architecture, Terrence T. Bills, Project Architect PHONE 253-572-3993

ADDRESS 902 North Second Street, Tacoma, WA 98403 EMAIL terry@tcfarchitecture.com

PROPERTY OWNER(S) Wenatchee School District No. 246 PHONE (509) 663-8161

ADDRESS 235 Sunset Ave, Wenatchee, WA 98801

SUBJECT PROPERTY ADDRESS 1401 Washington Street, Wenatchee, WA 98801

ASSESSOR'S PARCEL # 22209210500

LEGAL DESCRIPTION (Attach if necessary) See Attached Legal Description

AREA OF PROPERTY (in acres or square feet) 8.1 Acres, 353,062 sf

PLEASE ATTACH A DETAILED DESCRIPTION OF PROJECT.

This application shall be subject to all additions to and changes in the laws, regulations and ordinances applicable to the proposed development until a determination of completeness has been made pursuant to Chapter 13.07 Wenatchee City Code.

OWNER'S SIGNATURE _____ DATE 10/22/14

Updated 03/30/2011

CONDITIONAL USE PERMIT APPLICATION CHECKLIST

A Conditional Use Permit is for an allowable use in the applicable zoning district under certain specific conditions as approved by the Hearing Examiner.

USE THE FOLLOWING CHECKLIST TO ENSURE THAT YOUR APPLICATION IS COMPLETE

(NOTE: Incomplete applications may cause delay in processing.)

If you have any questions, please feel free to call the Department of Community Development, Planning Division at 509-888-3200.

Non-refundable fees due and payable UPON APPLICATION

➢ **Application fee**	$ 950
➢ **Application fee for home occupation or temporary parking facility**	$ 450
➢ **Public Works review fee** (except for home occupation or temporary parking facility)	$ 200
➢ **Landscaping Plan Review/Inspection** (if applicable)	$ 100

Fees payable PRIOR TO INSPECTIONS

(Call the Engineering Division at 888-3200 for quotes on fee below)

➢ **Sewer camera inspection** — $ 300 minimum or $145 per hour for camera truck OR jet truck; whichever is greater.

APPLICATION INSTRUCTIONS

1. Form: The application form must be complete and signed by each applicant, and each property owner if different than the applicant(s).
2. Legal: The application form must be accompanied by an accurate legal description of the subject property.
3. Plans: The application form must be accompanied by five (5) copies, and one electronic copy if available, of a scaled drawing depicting at least the following items:
   (a) the boundaries of the site;
   (b) the names of all streets bounding the site;
   (c) dimensions, locations and elevations of all buildings to be built or used;
   (d) the location, dimensions and design of off-street parking facilities, showing points of ingress and egress;
   (e) the surrounding property uses; and
   (f) pedestrian and vehicular circulation patterns.
3. RLCA analysis: Any analysis required under the Resource Lands and Critical Areas (RLCA) Development Chapter 12.08 WCC shall be included with the application. (Consult a planner for help or information on this item.)
4. Vicinity map: The application form must be accompanied by an 8 ½ x 11 inch copy of an area map locating the subject property, or a vicinity map placed on the plat map.
5. SEPA compliance: A completed environmental checklist shall be filed with the application, except a checklist is not needed if the City and applicant agree an EIS is required, SEPA compliance has been completed, or SEPA compliance has been initiated by another agency.

6. Landscaping: Landscape plans shall be submitted with the application in accordance with Chapter 10.62 WCC. Preliminary landscaping plans with general descriptions of types, locations, and quantities of required landscape elements will be sufficient for conditional use permit applications; provided, however, that final landscape plans shall be submitted and approved prior to the issuance of final permit approval.
7. Pre-Application Summary: The application form must be accompanied by an applicant-initialed copy of the formal pre-application meeting summary prepared by the City regarding the proposed development.

WASHINGTON ELEMENTARY SCHOOL BASIS OF DESIGN
(SCHEMATIC DESIGN PHASE)

INTRODUCTION

The Schematic Basis of Design (Design Criteria), as described herein, generally summarizes the design intent of materials and systems included in the Schematic Design cost estimate. The materials and systems may change as the project progresses, to meet the project design requirements and budget. The criteria include items known to be Wenatchee School District standards, and initial design intent responses.

A. ARCHITECTURAL

Site: The architectural site features generally include site amenities that supplement the work described below for civil and landscape.

1. Site Features
   a. Soccer Field: Approximately 135'x280'.
   b. Garden spaces for community programs.
   c. Paved outdoor play surfaces.
   d. Space for a future double wet portables with utilities stubbed to proposed portable location.
   e. Accessibility to all activity spaces.
   f. Black chain link fence around entire playground and field areas. There will also be decorative metal fencing at key areas.
   g. Playground equipment including basketball hoops, backboards and stationary poles, four-square courts, tether ball, wall ball courts and big toys.

2. Parking / Service
   a. On-site parking shared with the ECLC. Includes ADA spaces as required by code, with a goal of 108 spaces. (If it is determined that WSSP Credit S2.3 'Minimize Parking' is to be attempted, preferred parking must be provided for carpools, vanpools or alternative fuel vehicles. 5% of the allotted staff and visitor parking must be set aside for this preferred parking. Complete parking capacity must not exceed local codes.)
   b. Fire truck and emergency vehicle access within 150 feet of all portions of the building perimeter and shall meet City of Wenatchee Fire Department standards for slopes and turning radii.
   c. Lighting at parking lots and other key locations per the City of Wenatchee Zoning Code. Refer to WSSP Credit S5.1 for light pollution reduction requirements.
   d. Service yard area with garbage compactor and recycle containers enclosed by fence or wall with gates. Paved surfaces to support heavier vehicles and bump posts as necessary to protect mechanical and/or electrical equipment located in service area.

3. Architectural Site Amenities
   a. Flagpole
   b. Benches
   c. Building identification sign
   d. Pedestrian and vehicular code and way finding signage
   e. Sustainable signage

f. Bike racks and skate board racks will be distributed near monitored entry points around the building.
g. Also see landscape sections for site amenities such as playground equipment and landscaping.

Building: The building will constructed of Type II-B (non-rated and non-combustible construction). This is generally a steel framed building with exterior finishes as noted below. See the structural section for a description of anticipated building structural systems.

1. Exterior Wall System: Steel Framing with metal stud infill framing at 16 inches on center, fiberglass batt insulation in stud cavities and gypsum sheathing on the exterior face. Over the exterior sheathing, building wrap under 4 inch rigid insulation (Assume rigid mineral board insulation). Cladding installed as a rainscreen over metal furring, fastened through rigid insulation. See wall finishes below for interior and exterior finishes, and the structural section for assumed stud sizes and types.
2. Exterior Wall Finishes:
   a. Masonry Veneer: Walls will have some ground face CMU as illustrated on the elevations.
   b. Cement Board Panel Siding: Where CMU is not used, cement board panel siding (such as "Hardi-Panel" and "Hardi-board") with a rain screen will be utilized.
   c. Exposed Steel: Any exposed steel will be painted with high performance paint coating.
3. Roof System: Class "B" roof system. Steel framed roof construction with steel joists and wide flange beams, metal decking, cover board, rigid insulation and protection board.
   Roofing membrane depends on slope. Low sloped roofs (2:12 and less) will have a single ply membrane roof system. Higher sloped roofs (more than 2:12) will have an asphalt shingle system. See structural section for additional framing information.

4. Windows: An aluminum framed commercial window system with insulated glass will be used throughout the exterior with exception of aluminum store front systems used at key locations such as main entries.
5. Floor Finishes:
   a. Corridors – Public (main north-south corridor): Polished concrete as the basis of design.
   b. Corridors – Classrooms (east west corridors in Concept 'A', except in front of Commons which is considered public): Rubber tile as the basis of design. Assume Mondo rubber tile or equal.
   c. Classrooms: Primarily carpet, with areas of hard surface. This will vary by grade level and room type. For carpet, assume Collins & Aikman rubber backed carpet or similar.
   d. Life Skills: Rubber tile.
   e. Classroom Pods: Carpet and rubber tile.
   f. Office Areas: Carpet
   g. Library: Carpet.
   h. Storage and Work Rooms: Rubber tile and/or sealed concrete.
   i. Restrooms: Ceramic Mosaic Tile.
   j. Health Room: Sheet vinyl or sheet rubber.
   k. Multi-Purpose Room: Rubber tile.
   l. Gym: Resilient wood athletic flooring.
   m. Kitchen: Quarry tile with epoxy grout.
6. Interior Wall Finishes:
   a. Painted Gypsum Board: At all walls unless specifically noted for a special finish.
   b. Vinyl Wall Covering (VWC): Used as both a wall finish and tackable surface where budget allows. Assume VWC will be used at two classroom walls and classroom corridor walls above this wainscot.
   c. Ceramic Tile Wainscots: Assume 6 feet tall at all restrooms.

d. Wainscot: Three feet high at public and classroom corridors, hallways and stairs over gypsum wallboard. Assume MDF.

7. Interior Ceiling Finishes:
   a. Suspended 2'x4' Acoustical Panel Ceilings: At all rooms unless specifically noted for a different finish.
   b. Painted Gypsum Board: At restrooms, and possibly at storage rooms.
   c. Exposed painted steel structure (beams and decking) where indicated on drawings; generally at the Gym, Multi-purpose Room, Library and Main Entry Lobby.
   d. Exposed, unpainted structure: Mechanical, electrical and custodial rooms.
   e. Special Finishes: As the budget allows, other finishes may be identified for specific locations such as main north-south corridor, library, administration waiting area, etc.
8. Doors and Frames:
   a. Interior Doors and Frames: Solid core, wood veneer doors and hollow metal fully welded frames with high performance coating.
   b. Interior Relites: Hollow metal fully welded frames with high performance coating.
   c. Exterior: Heavy duty aluminum doors in storefront / curtain wall systems for primary entrances. Galvanized hollow metal doors and frames at secondary/service entrances with high performance coating.
   d. Hardware: Commercial grade hardware to match district standards. Fully mortised locksets.
   e. Operable panel partitions: Electric operable panel wall at Platform. Electric operable wall at Gymnasium.
9. Cabinets: Plastic laminate faced commercial grade casework.
10. Specialties: Metal mini-blinds at windows, magnetic marker boards, tack boards, projection screen brackets, fire extinguishers, toilet partitions, stainless steel toilet accessories, and other specialties as appropriate. Acoustical wall panels at Platform/Music Room, Gym, Multipurpose Room, and Library.
11. Athletic Specialties: At gym, two manual folding basketball backboard assemblies with glass backboard at main goals, and four manual side-fold height adjustable assemblies with fiberglass backboards at side baskets. Gym divider curtain, volleyball floor inserts, wall climbing boards and others as required by the school district.
12. Elevator: Hydraulic, holeless (no shaft) elevator for handicapped access to both floors.
13. Display cases in public spaces.

Sustainability: The building will be designed to meet the WSSP (Washington Sustainable Schools Protocol). Based on the design work today, the design team believes that the project should score between 50 and 55 points in the WSSP system, with 45 being the minimum level to pass. The building orientation on the site has been optimized and a high performance building envelope will be provided to reduce energy consumption. Energy conservation measures envisioned for the building systems include daylighting, occupancy sensor controlled plug loads, high efficiency lighting, a dedicated outdoor air system with heat recovery, and other high efficiency equipment and innovative controls-system measures and user interfaces to further the reduction in energy use. Careful selection of building materials and water conservation strategies will be implemented in line with the WSSP program.

B. Civil

Fire Protection: Per hydraulic modeling, the existing City water system capacity is approximately 2,100 gpm in the 6" main in Elliot and 4,000 gpm in the 8" main in Washington. There are three existing hydrants on Elliot. Field flow testing to check model accuracy has not been performed. System pressure ranges from 48 to 60 psi.

Per a preliminary discussion with the City Fire Marshal in March 2014, he stated that the fire flow requirement might be 8,000 gpm with a 75% reduction for sprinklers, or 2,000 gpm. This will have to be revisited once the building design is farther along.
There needs to be a hydrant within a reasonable distance of any fire department connection, assuming 100 feet for now. Hydrant spacing so that any point of the building is within 250 feet of a hydrant, as the hose lays.
The fire line size to the buildings has been stated to RH2 by Hargis as 4" for the ECLC building and 6" for the School District. RH2 has not received any flow requirement values so that we may review sizing.
In April 2014, the City stated the on-site mains should be looped and would be owned by the City. In July, the City revised this to state the on-site mains should be private. Each building should have a separate connection. The City has stated that the fire systems will require double check valve assemblies, and those may be located within the mechanical rooms. Whether additional backflow device(s) at the property line for the on-site mains serving on-site hydrants will be required has not specifically been discussed.

Domestic Water Service: RH2 has not received information regarding building water use. Receipt of fixture counts or peak water use will help for meter and service line sizing. For now, we are assuming a 4" diameter service line for the Elementary School, 2" for the ECLC building, and 2" for the future portable units.
Per the City, each domestic service will require a reduced pressure backflow assembly (RPBA). These may be located within the mechanical rooms.
We assume the domestic meter(s) should be located within public right of way, preferably in the sidewalk or a planter area, not in a traffic location.

Sanitary Sewer System: The sanitary sewer system will be designed to maintain gravity flow in accordance with the Department of Ecology Criteria for Sewage Works Design (Orange Book) August 2008. The system will discharge into an existing manhole on the City's existing main on Washington St. The existing sewer line will be removed at the completion of the new line. A short section of sewer main connecting into the ECLC building will be reused and tied into the proposed sewer improvements.

Stormwater System: The stormwater system will be designed to discharge at a rate not to exceed the current peak discharge rate. The system will be modeled using the SCS Type 1A rainfall distribution with assignment of 2.04 inches for the 24-hour, 25-year storm event based on the City's Comprehensive Stormwater Plan. It is anticipated that the stormwater system will be in a closed system potentially under the parking lot with an overflow to the City's system. Basic treatment will be provided in accordance with the Stormwater Management Manual for Eastern Washington. The City also indicated that it is acceptable to tie the roofs drains directly to the City's system.

Road Improvements: The City indicated that they would like to see ADA improvements on the NW, SW, and SE quadrant of Washington St. and Elliott Ave. They would also like to see ADA improvements on the NW and NE quadrant at the south end of Elliott Ave. They would prefer to see the existing mid-block crossing removed on Elliott Ave. unless there is an overriding reason why it should remain. The entrances to the school should be driveway approaches as opposed to directly tying the asphalt bus pullouts to the existing street. If possible, they would like to see a buffer placed between the pullout and sidewalk on Elliott Ave. similar to what is proposed on Washington St. AutoTurn templates will be used to determine bus off-tracking on the driveway approaches to ensure sufficient widths. The sidewalk on Washington St. may wrap down along the bus approach to allow pedestrians to cross behind the bus pullout

C. LANDSCAPE

Design Intent: The overall goal of the landscape will be to create open space and amenity spaces for the students and the community. To the north along Washington Street façade plantings will be provided to soften the entrance to the school and to create a park like feel as you approach. To the northwest an outdoor classroom and student garden space will be incorporated into the hillside creating with the use of terraced planters and plaza space. This garden area will allow students can learn about small scale agricultural practices. To the north east a sledding hill will utilize the sites natural topography. Sport fields will be designed for multi-seasonal play. A built outdoor play area consists of play equipment, basketball, 4 square, and tether ball areas. Permanent irrigation will be provided to all landscape and field areas for establishment.

Landscaping: Landscape areas will consist of mainly native and drought tolerant landscape plant material with an emphasis on low water use. Low growing plants will be used to maximize the security of the property by allowing only visual separation while maintaining sight views from the street to the building. The landscape design shall utilize the principles of CPTED. Traditional improved lawn areas will be minimized (except for the open play/ sport field) and meadow areas utilizing low growing, drought tolerant/native grasses will be incorporated to limit maintenance and water use.

Irrigation: Irrigation will be a combination of micro spray pop ups and rotors that will minimize the use of water. Incorporation of some rain water harvesting will be utilized mostly for garden areas and to be used as an educational tool.

1. Irrigation, although permanently installed, will be controlled to maximize the efficiency of the system during the plant establishment phase and may be phased out over time.
2. For long term irrigation needs the use of a smart controller, evapotranspiration data and rain sensor will be used to continually update the controller's program as seasonal needs change to reduce water waste.
   a. Reduction of irrigation by 50% of the landscape budget baseline will procure 1 point for WSSP Credit W1.1.
   b. If the maximum-allowed 2 points are desired for this Credit, the landscape plan would need to use native plants and/or plants that would not require irrigation beyond the two-year plant establishment period. Consideration of how this would affect the sports field/open play areas should be reviewed.
   c. If temporary irrigation is to be removed after the two-year establishment period (to ensure that irrigation is not used beyond two years) this stipulation should be included in the specifications for the landscape subcontractor.

D. Structural

Design Intent: The building is anticipated to be constructed to conform to a Type II B construction consisting primarily of structural steel framing. The roof is to be constructed with metal deck and steel open web joists and steel girders. The two story portion at the daylight basement, the elevated main floor is constructed with composite metal decking and concrete topping supported by steel girders. The mezzanines throughout the remaining portion of the building are supported in a similar manner. The daylight basement will have a concrete retaining wall. The building will be supported by conventional continuous concrete footings, a slab on grade and spread footings as required. The seismic lateral loads will be resisted by steel brace frames with grade beams. At the multipurpose wing, the masonry walls resist the lateral forces.

Design Criteria:

1. All methods, materials and workmanship shall conform to the 2012 International Building Code. Design loads shall be determined for ASCE 7-10 Minimum Design Loads for Building and Other Structures. Loads are as follows:

a. Risk Category: III
b. Roof snow load: Determined based on ground snow load equal to 56 psf.
c. Wind: 115 mph Exposure C
d. Seismic: Ss = 0.476g, S1 = 0.201g
e. Foundations: to be determined

Foundations:

1. Conventional concrete spread footings and continuous footings. Footings will bear 18 in. minimum below existing grade, and will be 18 in. minimum wide by 11" deep. At the gymnasium and commons, the footings will be 24 inch wide by 11 inch deep that support the masonry walls.
2. Four-inch concrete slab-on-grade floors with welded wire reinforcing at typical floors. At exposed concrete slabs or at the daylight basement slabs, #4 at 16" on center each way in a 4" concrete slab with Eclipse shrinkage reducing agent for the exposed slabs.
3. At elevators provide 4-ft. deep pits with 12-in. thick concrete slabs and 8-in. concrete walls.
4. Grade beams below braced frames are 36" deep and 36" wide.

Exterior Wall Framing:

1. Typical Framing: 8" by 20 gage non-bearing metal studs at 16" on center. Slip-track connections at the top of walls will be provided. Where metal studs back masonry veneer walls, 8"x18 gage non-bearing studs at 16" on center will be used.
2. CMU walls: 8" and 12" cmu will be solid grouted and be reinforced at 48" on center each way.
3. Brick Veneer: Anchored brick veneer with Dur-o-wal veneer ties at 16" o.c. each way. Veneer will be supported on foundation and re-supported at roof steps as required with a galvanized steel ledger attached to the wall structure.

Interior Wall Framing:

1. Typical Interior Wall Framing: 20 gage non-bearing metal studs at 16" on center. Slip-track connections at the top of walls will be provided.
2. CMU walls: 8" and 12" cmu will be solid grouted and be reinforced at 48" on center each way.

Elevator Shaft:

1. Wall framing: CH studs at 16" on center.
2. Steel hoist beam

Mechanical Platform Framing

1. Floor decking: 20 gage type W2 metal decking with concrete topping and steel welded wire mesh. Total slab thickness = 5-1/2".
2. Floor Framing: Composite steel beams and girders supported by HSS columns.

Mechanical Platform Framing

1. Floor decking: 20 gage type W2 metal decking with concrete topping and steel welded wire mesh. Total slab thickness = 5-1/2".
2. Floor Framing: Composite steel beams and girders supported by HSS columns.

Roof Framing:

1. Roof Sheathing: 20 gage Type B metal decking typical. At the multipurpose room and the library, acoustical metal deck will be provided.
2. Typical Roof Framing: Open-web steel bar joists typically spanning to wide flange steel beams supported by HSS columns in the interior and exposed pipe columns at the exterior. Open-web steel bar joists at multipurpose room to bear on cmu walls.

Lateral system:

1. Braced frames with HSS steel columns and braces bearing on concrete grade beams.
2. Masonry shear walls at the multipurpose wing.

E. MECHANICAL

Design Intent: The design intent for the mechanical system is to maximize energy efficiency and provide systems to the meet the unique needs of each space in the building. Systems will be designed in accordance with Wenatchee School District Building Standards.

Applicable Codes and Standards:

The mechanical design shall meet, but not be limited to, the following codes:

Washington Sustainable Schools Protocol (WSSP)
International Building Code (IBC)
International Mechanical Code (IMC)
International Fuel Gas Code (IFGC)
International Fire Code (IFC)
Uniform Plumbing Code (UPC)
Washington State Energy Code (WSEC)
National Fire Protection Association (NFPA)

The mechanical design shall meet, but not be limited to, the following standards:

ASHRAE Standard 52.1 – Gravimetric and Dust Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter
ASHRAE Standard 55 – Thermal Comfort
ASHRAE Standard 62.1 – Ventilation for Acceptable Indoor Air Quality
ASHRAE Standard 90.1 – Energy Standard for Buildings Except Low Rise Residential
SMACNA – Sheet Metal & Air Conditioning Contractors

Design Criteria

Table 1- Outdoor Design Temperatures

Design Season	Temperature
Outdoor Winter DB	6.1°F*
Outdoor Summer DB	95.7°F*

*Values taken from 2013ASHRAE Handbook Fundamentals, 99.6% Heating DB and 1% Cooling DB for Yakima, WA which is the most similar climatic design information available..

Table 2- Building Envelope

Building Envelope	U-value	Component Description
Exterior Wall	0.03	Metal stud framed wall 16" OC with R-25 batt insulation in cavity and R-11 continuous rigid insulation at exterior of stud
Glazing	0.38	SHGC = 0.40
Exterior Door	0.37	Hollow metal door, insulated core
Roof	0.032*	R-30 continuous rigid insulation above deck
Perimeter Slab Insulation	F=0.57*	R-10 rigid insulation with thermal break

*Values taken from 2012 WSEC default values.

Testing, Adjusting, and Balancing: The contractor will be required to hire an independent Balancing Agency (holding current certification from the National Environmental Balancing Bureau or from the Associated Air

Balance Council) subject to approval by the Owner. The balancing agency shall have minimum three successfully completed projects of similar size and complexity in the last five years.

Commissioning: The mechanical and plumbing systems will be commissioned by independent Commissioning Agent experienced with minimum three successfully completed projects of similar size and complexity. Mechanical systems will be commissioned in accordance with the Specifications (including Function Performance Testing of components as well as systems) to be provided by Commissioning Consultant hired by the Owner.

Plumbing Systems:

1. Utilities: The mechanical systems will be connected to site water, fire and sewer services designed by the civil engineer. Connection will be at 5'-0" outside of the building. All roof drainage will be exterior to the building and will be picked up by the site work contractor and connected to the storm drainage system designed by the civil engineer.
2. Water Service: The main building water service will enter the building into the boiler room on the west end of the building. The service riser and backflow preventers will be located in this space and will separately serve the domestic cold water systems, domestic hot water systems, and hydronic heating/cooling system. Water piping services throughout building will be lead-free soldered or brazed type L copper piping.
3. Irrigation: The water service for landscape irrigation will not enter the building and will be covered under the Landscape consultant's scope of work.
4. Domestic Hot Water System: A Natural gas fired high efficiency domestic water heater will be located in the boiler room depending on final concept. Proposed basis of design shall be Lochinvar. The heater will supply domestic hot water to the entire facility. The domestic water heater will be designed with hot water recirculation piping and pumps to keep hot water available at fixtures.
5. Plumbing Fixtures: All plumbing fixtures will be selected for use appropriate to area of installation. Fixtures will be selected in coordination with the Owner and Architect as the design progresses. In general, low-flow fixtures will be selected to reduce water consumption. Water closets will use high capacity carriers with battery powered automatic flush valves unless otherwise directed. Emergency fixtures will be provided in Classrooms and Shop spaces as required. Wall hydrants will be provided in multi-fixture toilet rooms.
6. Sanitary Waste and Vent System: A sanitary waste and vent system will be installed to serve all fixtures within the building. Piping shall be cast-iron with no hub fittings. Specialty sanitary waste and vent system components will include and oil/water interceptor for all drains in the Auto Tech. area. Electronic trap primers will be provided for all floor drains, funnel floor drains, and floor sinks.
7. Natural Gas System: The high-pressure natural gas piping from offsite to the building will be provided by Cascade Natural Gas, including meters. The gas meter will be located outside the boiler room. Piping from this meter shall be threaded or welded black steel, and will serve the boilers, water heaters and any gas fired kitchen appliances.

Fire Sprinkling System: The building will be completely sprinkled with wet system coverage in conformance with NFPA 13 and local AHJ requirements. The design will include a wet pipe system to serve all interior occupied areas and combustible void spaces. Wet system piping shall be black steel with threaded or mechanical grooved joints. Where design coordination allows, building overhangs will be protected with dry sidewall heads off the wet system. A dry system will be provided to cover large building overhangs as required by the AHJ. Dry system piping shall be galvanized steel. Concealed heads or head guards will be provided at all sprinkler heads subject to damage.

The fire sprinkler service entrance to the building will be located within the main mechanical room plant space with direct access to the building exterior.
Fire system backflow prevention will consist of a double detector check valve (DDCV) assembly located inside the building in conformance with local AHJ requirements. A fire department connection and post indicator valve will be located on site with a separate service line and point of connection outside of the building to serve these devices by Civil.

Heating, Ventilating and Air Conditioning System:

1. Ventilation: Ventilation systems serving each area of facility are as follows.
   a. Classrooms- Dedicated air handling systems shall serve zones via ceiling mounted diffusers and return grilles. Systems will be connected to hydronic heating and cooling systems. Each air handling unit shall be configured with direct drive fans with variable frequency drives for balancing and variable air volume control. Corridors adjacent to classrooms will be served by classroom air handling units.
   b. Administration - VAV terminal units shall be provided to serve spaces to serve overhead supply air diffusers. Central variable volume air handling unit. Corridors will be served off adjacent administration or classroom central air handling unit system.
   c. Gym/Commons/Platform- Air handling unit system design with overhead ductwork will serve each space. Air handling unit basis of design shall be Trane Performance Climate Changer modular air handlers. CO2 sensors will be provided for demand ventilation control. Low wall return air grilles will be located at corners of the space to mitigate stratification.
2. Heating Water System: A central hydronic heating water system will provide heat to all air handling systems in the building. The system shall consist of gas fired condensing boilers, variable speed split-coupled vertical type base mounted pumps designed for parallel operation, air separator, expansion tank, chemical feeder and make-up water assembly.
   a. Boilers: High efficiency condensing gas fired boilers shall be provided. Boilers shall be designed for a design temperature of 140 degrees at design heating day but will be controlled with a reset strategy to keep heating water supply temperature as low as possible to maximize energy efficiency. The reset limits shall be 120 to 140 degrees F. Proposed basis of design shall be Bryan TF.
3. Chilled Water System: A central hydronic chilled water system will provide chilled water to all air handling units. The system shall consist of an air cooled chiller, variable speed split-coupled vertical type base mounted pumps designed for parallel operation, air separator, expansion tank, chemical/glycol feeder and make-up water assembly.
   a. Chiller: The chiller shall be a high efficiency variable air cooled screw chiller. Basis of Design shall be Trane RTAE.
4. Building Piping and Valves: Heating and cooling system piping shall be black steel for all mains above 2-1/2" in size and type L copper for all sizes 2-1/2" and below. Dielectric nipples shall be used at all connection points between dissimilar metals. All control valves located at equipment shall be 3-way or 2-way modulating type. All isolation valves shall be ball or butterfly valve type.
5. Exhaust Systems: Dedicated outdoor air system fans will handle exhaust air for custodial rooms and toilet rooms adjacent to classroom wings. Dedicated exhaust fans will serve the custodial and toilet rooms in other areas and will also serve the kitchen hood and dishwasher. Exhaust fans will also be provided to handle heat gain from electrical closets, IDF and boiler room spaces. Fans will be direct drive type with speed controller.
6. MDF/Elevator Machine Room Cooling Units: Split system air conditioning units will provide separate and independent means of cooling these spaces.
7. Ductwork: Ductwork system shall be galvanized sheet metal throughout and installed per SMACNA standards based on specified pressure classification.

Energy Management and Control System (EMCS): The mechanical systems in the building will be controlled and monitored by a direct digital energy management control system with BACnet interface and web-based capability. In addition to controlling the mechanical systems, the controls will be capable of monitoring and controlling other systems in the building such as energy metering and lighting controls. The control system will interface with the existing central control system located at Pioneer Middle School. Basis of design shall be Automated Logic.

F. ELECTRICAL:

Site Work:

1. Trenching for various electrical systems including:
   a. Underground primary service laterals for power distribution.
   b. Underground secondary service laterals for power distribution.
   c. Underground feeders for site lighting.
   d. Underground low-voltage services.
   e. Underground low-voltage pathways between buildings, including fire alarm cabling.
14. Concrete pads and vaults for various electrical systems including:
   a. Primary electric utility transformer.
   b. Electrical and low-voltage vaults for future portables.

Power Distribution System:

1. Service:
   a. Service shall be run underground from Washington Street to a pad-mounted utility transformer located at the NW corner of the building adjacent to the main electrical room. This transformer shall supply the main distribution switchboard located in the main electrical room. The service shall be sized per code plus approximately 25% future capacity.
   b. The most economical service voltage shall be a 480V service with step down transformers for branch 208Y/120V loads.
   c. Service equipment shall be a switchboard, suitable for service entrance with copper busing and a main circuit breaker. No primary metering or switching shall be provided.
2. Distribution:
   a. The distribution system shall be configured in a radial fashion with feeders from the main switchboard serving panels in the kitchen, classroom wings and administration areas.
   b. Branch circuits for computer/receptacles, lighting, the kitchen, and mechanical loads shall be connected to separate panelboards. Computer/receptacles as well as kitchen loads will be fed from 208/120V panel boards. Lighting and mechanical loads will be connected to 480/277V panelboards.
   c. Feeder circuits shall be in the building structure or under the building slab using concealed conduit with individual conductors.
3. Emergency Distribution System:
   a. The emergency distribution system for emergency lighting will consist of wall-mounted "bug eye" type fixtures and in some cases, dual-purpose exit signs with integral "bug eyes" to limit device quantities.
4. Branch Panelboards:
   a. Panelboards shall be 480Y/277V or 208Y/120V, three phase, four wire. They shall have multiple sections where required. Multiple section panelboards shall be the same size and type. Panelboards shall be copper bus, bolt-on circuit breakers with full neutral and grounding bar.

b. Panelboards shall be surface-mounted in service areas such as electrical rooms, mechanical rooms, and unfinished spaces. Panelboards in finished spaces shall be flush-mounted.
c. Panelboards shall be specified with transient voltage surge suppressors on each computer panel.
d. Panelboards shall be specified with 25% space and 25% spare breakers.

5. Branch Circuits:
   a. Branch circuits shall be installed above grade using concealed conduit with individual conductors.
   b. Branch circuits shall be run with a dedicated neutral conductor for line to neutral loads at both 277V and 120V.
   c. Branch circuits shall be a minimum of 20 amperes (#12 AWG) stranded wire.
6. Convenience Outlets:
   a. Receptacles shall be located on approximately ten-foot centers in classroom areas (not including computer stations), and approximately on 50-foot centers in corridors. Office areas will have at least one outlet on each wall. Exterior receptacles shall be located at HVAC units and in service areas for equipment.
   b. Outlets shall be alternated on circuits to avoid adjacent receptacles being served on the same circuit. Receptacle outlets shall be limited to four or five per circuit. Computer outlets shall be limited to 2 or 3 per circuit.
   c. Dedicated circuits shall be provided for District-designated equipment such as refrigerators, microwaves, copiers, laminators, and similar loads.
   d. Surge protection will not be provided on individual receptacles.
7. Grounding:
   a. A grounding system consisting of a continuous equipment grounding conductor will be connected to building steel, metal underground water piping, to all equipment ground buses, enclosures, and installed in conduit systems, etc.
8. Metering:
   a. Metering devices will be installed at the main service entrance, as well as each individual panelboard to monitor the power usage by load type throughout the building. This information will potentially be displayed in a graphical format on an interactive touch screen near the building's entrance.

Wiring Materials:

1. Conduit:
   a. Conduit installed above grade shall be EMT. Where subject to damage or moisture, rigid metallic conduit shall be used.
   b. Conduit for underground circuits shall be electrical grade, schedule 40 gray PVC conduit. 90 degree bends and transitions from PVC to EMT shall be with rigid steel sweeps.
2. Conductors:
   a. Service lateral and feeder circuit conductors shall be individual insulated copper conductors. Insulation type shall be THHN.
   b. Branch circuits shall be individual insulated copper conductors. Insulation type shall be THHN.
3. Boxes and Fittings:
   a. Device boxes shall be one piece, deep, non-welded device boxes.
   b. Conduit fittings for all above grade circuits shall be steel, compression fittings.
   c. Conduit shall be attached using one-hole clamps.
   d. Electrical materials shall be attached with wood screws for wood building components, to steel studs using sheet metal screws and to structural steel with beam clamps.
4. Wiring Devices:
   a. Receptacles shall be duplex nylon face, with stainless steel cover plates. Switches shall be heavy duty, twenty ampere. Final color, types, and manufacturers to be confirmed with Owner.

b. Ground fault interrupter outlets shall be provided in areas subject to moisture, including adjacent to sinks.
c. Tamper-proof receptacles will be specified throughout a majority of spaces as required by the 2014 National Electric Code.
d. Wire guards shall be provided on fire alarm, intercom, emergency lights, and security devices in the gymnasium.
e. Plastic covers or other tamper proof systems shall be provided on fire alarm hand pull stations in corridors or other unsupervised locations.

Lighting System:

1. General: The lighting systems generally shall be designed in accordance with the Illumination Engineering Society's recommendations, and the Washington State Nonresidential Energy Code. Illumination levels in specific areas shall be based on the IES recommended levels for the specific area where these levels can be met while maintaining the lighting power density requirements of the Energy Code for the area use. The IES illumination level recommendations are based both generally on the type of activity, as well as specifically for particular areas/uses in school facilities.
2. Area Recommendations: Lighting recommendations for specific areas are as follows:
   a. Classrooms: Luminaires shall be specified as grid-mounted 2'x2' or 2'x4' LED type. Luminaire types shall be coordinated with the Owner and Architect prior to specifying.
   b. Offices: Luminaires shall be specified as grid-mounted 2'x2' or 2'x4' LED type. Luminaire types shall be coordinated with the Owner and Architect prior to specifying.
   c. Library: Luminaires shall be specified as pendant-mounted LED type. Luminaire types shall be coordinated with the Owner and Architect prior to specifying.
   d. Corridors: Luminaires shall be specified as grid-mounted 1'x4' or 2'x4' LED type. Luminaire types shall be coordinated with the Owner and Architect prior to specifying.
   e. Gymnasium: Luminaires shall be specified as fully-enclosed pendant-mounted LED type bowls resembling traditional high bay fixtures. Luminaire types shall be coordinated with the Owner and Architect prior to specifying.
   f. Multipurpose Room: Luminaires shall be specified as fully-enclosed pendant-mounted LED type bowls resembling traditional high bay fixtures. Luminaire types shall be coordinated with the Owner and Architect prior to specifying.
   g. Storage Areas: Fixtures shall be specified as chain-hung or surface-mounted LED strip fixtures. Luminaire types shall be coordinated with the Owner and Architect prior to specifying.
   h. Mechanical Spaces: Fixtures shall be specified as chain-hung or surface-mounted LED strip fixtures. Luminaire types shall be coordinated with the Owner and Architect prior to specifying.
3. Exterior Lighting:
   a. Exterior lighting source shall be LED. The luminaires shall be both pole-mounted and building-mounted.
   b. Exterior Lighting is not to exceed IESNA foot level requirements as stated in the IESNA RP-33 *Recommended Practice for Exterior Environmental Lighting* per WSSP Credit S5.1.
   c. Pole mounted fixtures shall be cutoff style with finish selected by the Architect. Poles shall be anodized aluminum or galvanized steel. Poles shall be 20' to 30' tall, with occupancy sensor mounted at ~20', straight round tapered. Style and finish shall be selected by the Architect.
   d. Foundations shall be cement concrete flush with sidewalks or lawns, except in parking areas where subject to damage in which case the foundations shall be raised thirty inches above grade. Exposed concrete portions of area lighting pole bases shall be finished in exposed aggregate.
   e. Building-mounted lighting shall be primarily used to mark building entrance locations or provide security lighting in areas susceptible to vandalism.

f. Pole mounted lighting shall be used to illuminate parking and traffic areas.

4. Exit/Emergency Lighting:
   a. Exit signs shall be powered, LED type with integral battery packs. Exit sign locations shall be determined by exit path requirements of the International Building Code as interpreted by the Architect/Building Official.
   b. Wall-mounted "bug eye" type emergency light fixtures with integral batteries will be located throughout the facility to meet the minimum egress lighting requirements defined in the IBC.
5. Lighting Controls:
   a. With the exception of corridors, local switches will be provided in each space within the facility. The switches shall be located adjacent to the entrance to the space. Where there is more than one entrance to the space, lighting system controls may be provided at each entrance.
   b. The lighting system in each classroom shall utilize recessed light fixtures with integral photocells and occupancy sensors. Each light fixture will harvest daylight per the WA State Non Residential Energy Code. Switches within each classroom shall utilize a standard wireless protocol to communicate with each fixture for on/off functionality as well as scene and dimming control. Luminaires shall be manually turned on and will turn off automatically per the 2012 WA State Energy Code.
   c. The lighting system for the corridors, mechanical spaces, and common areas will be switched remotely by relays and controlled by schedule through the energy management system.
   d. Exterior lighting will be switched remotely by relays and controlled by schedule through the energy management system as well.

Telecommunication Systems:

1. Telecommunications Grounding System:
   a. The telecommunications grounding system shall provide an equipotential between telecommunications spaces for the protection of sensitive electronics and to reduce the possibility of interference in the transmission of digital signals throughout the facility. Entrance protection and 110 cross-connect wall fields will be provided for the termination of voice backbone cabling and voice cross-connects and shall be connected to the grounding system. Each telecommunications room will be provided with a dedicated telecommunications grounding busbar and connection to building ground. Equipment racks and components shall be bonded to the telecommunications busbar and all telecommunications busbars shall be connected with a common telecommunications bonding backbone.

2. Telecommunications Raceway:
   a. Pathways to support horizontal cabling will consist primarily of open cabling methods. In some areas where no accessible ceilings exist, conduit pathways will be utilized. Workstation devices will consist of a dedicated 1 inch conduit to a 4-11/16 inch square outlet box with a single gang plate at a minimum stubbed up into the ceiling space.
   b. Interbuilding conduit pathways will consist of (1)4" – Telco Demarc, (1)2" – District WAN, (1)2" – Cable TV and (2)4" – Early Child Learning Center underground conduits from the property line to the TR-MC, maintenance holes will be provided based upon the overall distance between pull points. The district's WAN singlemode optical fiber and other utilities will be extended to the main telecommunications room via underground conduits from the property line. The new conduits shall be encased with 3000 psi rated concrete under vehicular traffic (roadways, drives, parking areas).

Conduits shall be sloped towards the maintenance hole to avoid water infiltration and sealed with inflatable bags.

c. Intrabuilding conduit pathways will consist of (3)2" – Future Portables underground conduits with a handhole/maintenance hole located near the portable pad. In addition (2)4" underground conduits will be provided between the TR-MC and the TR-HC rooms.

3. Telecommunications Distribution System:
   a. The copper connectivity and cabling infrastructure shall be a Category 6 system as defined in ANSI/TIA/EIA – 568B, Part 1 and Part 2 standard. The optical fiber connectivity and cabling infrastructure shall consist of both laser optimized multimode and singlemode as defined in ANSI/TIA/EIA – 568B, Part 3 standard. Supplemental twisted pair copper backbone cabling shall consist of Category 3 multi-pair cabling.
   b. Horizontal station cabling shall terminate on modular 48-port patch panels with 8-pin, 8-conductor modules with 110 IDC connections on the back of the patch panel. Optical fiber cabling utilized for voice and data networks shall terminate in rack mount fiber cabinets with SC connectors.
   c. The manufacturer for both copper and optical fiber infrastructure shall be an Ortronics/ Berk-Tek solution per the Wenatchee District standard and shall include a performance based warranty for a period of not less than 15 years from the date of installation. Equipment racks, vertical cable management, ladder tray and grounding busbars shall be an Ortronics solution.
   d. Structured Cabling (Voice and Data Cabling) will be provided to each classroom and administrative area. The device quantities vary from space to space based upon usage and the quantity of computing devices expected in those areas. The typical classroom will have structured cabling at four locations in each classroom. Additional connections are provided in computer labs and shared spaces. The pathways that have been designed to support this cabling have been sized to accommodate the addition of cabling in the future should future programming require additional network connectivity. Cabling will also be provided to connect wireless access points, classroom AV devices and IP video surveillance cameras.

4. Classroom Audio Visual System:
   a. The classroom audio visual system will provide IR wireless voice reinforcement, and amplified playback of music/media, computer interface, and/or other audio/video program material. The system includes all of the equipment necessary to distribute the audio and video signals from the classroom computer/document camera, wireless microphone, and wireless tablet to the overhead projector and ceiling speakers.
   b. The system can be controlled using a wall mounted controller with individual selector buttons and an overall program volume control. The controller will be located near the entry door as this is a central location between the teaching wall and the back of the classroom. An assistive listening system (kit) will be provided to meet ADA requirements and can be utilized on an as needed base with convenient connections at the teaching location.
   c. Input/ Output plate consisting of HDMI, VGA, Composite, audio input and assistive listening, video projector, Apple TV, cabling, controller, sound enhancement system, and ceiling enclosure will be included.

5. Gymnasium and Multipurpose Audio Visual System:
   a. The Audio Visual (AV) system is to be a complete public address system for the pick-up, recording, and amplified playback of music, voice, video and/or other AV program material. The video projector screen is specified by the Architect. The video projector will be mounted in a protective housing and will be installed on a scissor lift with pre-programmed stages. This allows the video projector to be

raised out of harm's way when not in use and lowered down to a standing level for ease of maintenance.

b. The sound system consists of front-fired powered loudspeakers and a permanent equipment rack with remote and local functions.
c. The permanent rack will house a DSP, video matric switcher, wireless microphone system, assistive listening system and playback equipment. The system will have hard-wired inputs for microphone/aux, HDMI, composite and VGA video in various locations. The AV input plates will allow users to show presentations from a laptop, DVD/Blu-ray, tablet or other computing devices to project the content over LCD video projector.
d. The system will include a portable equipment rack containing all sound electronic components, including a 16 channel mixer board. The system is completely portable by connecting to the provided loudspeakers or connecting it the input plate to utilize the installed loud speakers.
e. This system is controlled completely by remote control operation. It can be turned on, volume set, video selection without having to access the equipment. Remote playback of pre-loaded music/program material is also possible through infra-red remote control from within the room.
f. The multipurpose will have a separate sound system for individual use and integrated with the gymnasium audio visual system for combined large venues.

6. Music Classroom Sound System:
   a. The portable sound system will provide a complete operating stereo system for the pick-up, recording, and amplified playback of music, voice, and/or other audio program material.
   b. The stereo sound system is designed for high fidelity wide frequency bandwidth and wide dynamic range playback of pre-recorded program material as well as having the ability to make recordings with the specified equipment.
   c. The system features a portable equipment rack containing all system electronic components, including a 16 channel mixer board. The system is completely portable by connecting to the provided loudspeakers that are supplied with mounting tripod stands and necessary patch cables.
   d. The equipment rack shall provide for a permanent and secure mounting of the amplifier, compact disc player, and other miscellaneous equipment. High quality recording microphones, ceiling microphones and companion accessory equipment shall be provided as noted to facilitate recording with the system.

7. Digital Signage System:
   a. The digital signage system will be provided by the owner, the design will provide power and network connectivity only.

8. IP Intercom Clock System:
   a. The system solution is under review by the district, below is what is anticipated to be the solution if an IP based system is desired.
   b. The intercom system will be an IP based system utilizing the Category 6 structured cabling system for IP devices. The intercom system shall use primarily IP intercom speaker digital clock combination units with integrated two-way microphones, optional call button can be utilized if desired. The IP intercom clocks will be powered by the Power over Ethernet switches located in the telecommunications rooms.
   c. Analog paging speakers will be used to supplement the system in common areas, exterior spaces and corridors. The analog speakers are powered by an amplifier and are integrated into the data network

by an IP zone controller. Each zone controller can support (1) zone and will be provided as needed in the telecommunications rooms to separate interior and exterior zones.

d. The system shall be integrated with the Shore-Tel telephony system being provided by the owner via SIP protocol. The system shall be primarily software controlled and configured; it will reside on a network server within the district's IP network, licenses and programming shall be provided by the contractor. Software will be Syn-Apps and hardware will be from Advanced Network Devices (IP Devices) and Atlas Sound (analog speakers). The system shall be accessible from the outside the school via the district WAN or web browser. The system supports audio and text messaging through the intercom speakers and digital clocks for event notification or in an emergency. The audio and text messages can be live or pre-programmed.

Security and Life Safety Systems:

1. Access Control System:
   a. The access control system will provide electronic access control to exterior doors throughout the facility. The electronic access control system will be owned and maintained by Wenatchee School District and integrated into the district wide access control system. Electronically controlled doors shall be centrally controlled from a single management point and shall be configured to open based upon time of day (central clock) or by the presentation of an authorized user credential (proximity card). The system shall be integrated with the intrusion detection system to perform specific functions as noted below. The overall intent of the electronic access control system is to minimize the need for faculty and staff to be issued and use physical keys. All electronically access controlled doors will be equipped with standard physical key hardware; however keys will be tightly controlled to reduce the likelihood of them being stolen or lost. The system includes long term record retention and customizable reports that can be used by the owner for maintaining the system and for forensic discovery of usage patterns and/or other system issues. The system shall support remote connections as determined by the district for maintenance and configuration from off-site locations. An emergency "lock-down" button will be provided in the main office area that upon activation will immediately lock all exterior doors and will block any time based unlocking until the lock-down button is de-activated.
   b. Exterior Door Functionality:
      - Specific exterior doors will be selected during the design phase of the project to be equipped with proximity readers based upon intended pedestrian routes and the proposed operations of the facility. The main entry vestibule will serve as a controlled entry point for visitors with an intercom door entry system. It will be the responsibility of district to educate and instruct users on the acceptable entrance locations to the facility. Access to these exterior doors will be controlled in several different ways. Main entry doors to the school will be programmed to automatically unlock in the morning and in the afternoons to accommodate typical student access. During the hours where the doors are not scheduled to be unlocked, the doors will remain locked until a valid credential (proximity card) is presented to the card reader. The access control system will also be configured not to automatically unlock the exterior doors unless the intrusion detection system has been disarmed to avoid a condition where the exterior doors are unlocked, but no employees are present. Exterior doors that are not noted as main entry points will be configured in an always locked condition and access will be granted by card read only (not time controlled). Exterior doors not equipped with electronic access control are not intended to be used for ingress (egress only).
   c. ADA Auto-Operator:
      - The normal sequence of operation for an ADA automatic door used with the electronic access control system would be that the electrified door hardware would be unlocked during normal entrance times and the ADA operator button would be enabled for public use. After hours or

anytime the access controlled door is locked, the exterior ADA auto-operator button would be disabled. A valid card read (and PIN code when required) when the door is locked would unlock the door and enable the exterior ADA button. The interior ADA button is always enabled (24/7) to unlock the electrified door hardware and actuate the automatic opener for egress purposes. For both entry and exit purposes, there will be a slight delay allowing the door hardware to unlock prior to activating the auto-operator.

2. Intrusion Detection System:
   a. The security system shall provide reliable intrusion detection and transmit an intrusion alarm condition to districts monitoring agent. All school interior corridors, and major areas will be supervised and monitored by the intrusion alarm system to provide full security coverage. Equipment and application will motion detectors to be installed along major corridors and near exterior doorways. Separate security zones with keypads will be created allowing the district to permit usage of the gym and/or cafeteria without compromising the intrusion security for the rest of the facility. A supervisory panel will be provided for status annunciation of the security system.

3. IP Video Surveillance System:
   a. Video surveillance monitoring will be accomplished using IP based video cameras with ExacqVision server based Video Management System (VMS), and connected via the converged data network. Cameras shall be a mix of megapixel cameras, mounted in enclosures or housings suitable for the environment in which they are installed. Cameras shall cover all exterior doors, corridors, common spaces and exterior spaces including; parking lot, bus turn-around and gathering locations. The storage of image files will be on a server known as a Network Video Recorder (NVR) which will reside in the telecommunication room.
   b. Monitoring functions can be supported anywhere with IP connectivity to the school. The system shall be completely scalable to support any number of cameras. The system shall be capable of displaying live or stored video from any network connected device (Computer, PDA, Etc.) provided that permissions are granted, and there will be no limit to the number of viewing clients allowed.

4. Distributed Antenna System:
   a. The distributed antenna system (DAS) will serve the emergency responders in an event of emergency with internal radio communications. It has not been determined if this will be required by the City of Wenatchee/ Fire Marshall at this time.

5. Fire Alarm System:
   a. The fire alarm system shall consist of an addressable fire alarm system with a main control panel, remote control/annunciator panel, graphical annunciator panel, initiating, signaling, and output devices.
   b. The main fire alarm control panel will contain addressable input modules, test circuits, relay modules, the battery backup system, and signaling modules. The panel will be surface mounted to permit access for expansion or additions.
   c. The remote LCD annunciator panel will be located in the main office. The panel will be flush mounted.
   d. The graphical annunciator panel will be located in the main entrance where it is visible from the outside. The panel will be flush mounted.
   e. The initiating devices will consist of code required, manual hand pull stations, heat detectors, smoke detectors, duct smoke detectors, and fire protection sprinkler valve and flow monitor switches. The location and arrangement of these devices will be determined by code requirements. Duct smoke detectors will be provided at the location of mechanical air handlers with air flows over 2000 CFM.

Tamper and flow switches will be provided for wet and dry fire protection sprinkler systems. Hand pull stations will be provided at exit locations required by code, flush mounted at forty-eight inches above the finished floor.

f. The signaling devices will consist of audible/visual horns/strobe combinations in classrooms, with audible/visual horns/strobe combinations in main corridors and common areas, and an exterior 10" bell on the building exterior. Signaling devices will be mounted at eighty inches above finished floor and located near the door in classrooms. Devices may also be ceiling-mounted as allowed by the AHJ.
g. Outputs will consist of signals to the HVAC unit shutdown relays, and magnetic fire door hold opens, which will be specified under other Divisions of the specifications. These devices will be located at the HVAC unit control location and at doors designated by the Architect or Code Official for automatically released fire doors.
h. Wiring for the fire alarm system will be installed in a standard "open cable" method. The conductors will be individually insulated copper conductors.
i. The system will function as follows:
    - The activation of a manual hand pull device or other initiating device will generate the following:
        - Sound audible alarm devices and operate visual alarm devices automatically.
        - Release fire doors to close.
        - In addition to the above functions, actuation of a duct detector will shutdown air handling units in the actuated zone only.
j. The fire alarm system will be powered from normal power and internal backup batteries. The system and will be constantly supervised via an IP-based communications method.

G. FOOD SERVICE:

Design Intent: The Washington Elementary School is to include a 900 square foot Heat and Serve Re-Therm kitchen complying with federal ADA mandates serving breakfast and lunch in an open servery for 600 students, with additional participation to be determined in a 168 seat MPR space. Limited kitchen space accommodates dry storage room, walk-in cooler, administration/desk area, transport staging, combi and convection ovens, scullery, and servery equipment within the kitchen. No food preparation will be done on site.

Equipment: Equipment is to be 100% new (not relocated/reused). Equipment selection is to be based on a number of factors such as durability and maintainability; both of which are important in this application. The Equipment is to be commercial grade, and Energy Star rated in categories available and as energy efficient as possible where Energy Star categories are not available.
Current Equipment included is as follows:

Description

1 Fly Fan
2 Walk-In Cooler Assembly
3 Pan Racks
4 Dunnage Rack
5 Unit Cooler (Cooler)
6 Cooler Shelving
7 Reach-In Freezer
8 Transport Cart
9 Convection Oven (Double Stacked)
10 Stainless Steel Wall Flashing

11 Exhaust Hood W/ Make-Up Air (Type 1)
12 Combi Oven (Double Stacked)
13 Water Filter
14 Hand Sink W/ Soap & Towel Dispenser
15 Eye Wash
16 Dry Storage Shelving
17 Fire Suppression System
18 Wall Shelf
19 Clean Dishtable
20 Pot Shelving
21 Ventless Dishwasher W/ Booster Heater
22 Soiled Dish Table
23 Refrigerated Serving Counter (4 Pan)
24 Hot Serving Counter (4 pan)
25 Silver and Tray Cart
26 Refrigerated Serving Counter Dbl. Sided (4 Pan)
27 Milk Cooler (Dual Access)
28 Cashier Unit
29 Compliance Table
30 Remote Condenser (cooler)
31 Stainless Steel Pass Shelf
32 Utility Counter

Floors: Quarry tile type finish floors in kitchen.

1. Bases, integral with floor, are to have coved corners.
2. Grout to be suitable for high acid food spills in kitchen.
3. All floors to be pitched to area drains to ensure elimination of standing water and adequate drainage of floor.
4. Design kitchen areas for a minimum 100-lbs./sq. ft. (450 kg.cm2) live load capacity.

Walls: All walls in contact with or within 6" (150 mm) of any cooking equipment shall be constructed of non-combustible heatproof materials.

1. Walls in foodservice areas shall be constructed using waterproof (green) gypboard or non-paper faced product covered full height, with FRP Paneling.

Ceilings: Ceiling surfaces must be smooth, easily cleanable and light in color.

1. Lay-in ceiling tile must be non-porous and non-fissured.

Lighting: General lighting fixtures complete with lamps, wiring and switches.

1. All exposed lamps MUST be plasticized shatterproof.
2. Illumination levels shall be in accordance with local codes or recommendations of the Illuminating Engineering Society (IES) with the following minimum foot candle levels measured 36" above floor line.
   a. Dry and refrigerated storage areas 25
   b. Preparation areas 50
   c. Production areas 70

Regulations: All work and materials shall be in accordance with the latest rules and/or regulations of agencies/authorities having jurisdiction. All regulations, including building codes, and other codes applying to this jurisdiction should be followed. In addition all equipment shall comply with the following:

a. Local Health Code.
b. National Fire Protection Association, Kitchen Ventilators (NFPA-96).
c. National Electric Manufacturer's Association (N.E.M.A.).
d. Underwriters Laboratories Inc., (U.L.), must bear label. National Electric Code, (N.E.C.).
e. National Sanitation Foundation, (N.S.F.), including NSF-7, must bear label in jurisdictions requiring the same.
f. American Society of Mechanical Engineers must carry the (A.S.M.E.) stamp.
g. American Gas Association, (A.G.A.).
h. Occupational Safety and Health Act (O.S.H.A.) Standards.
i. Hazard Analysis Critical Control Path (H.A.C.C.P.) Standards.
j. American Disability Act (A.D.A.) Standards.
k. Federal Energy Independence and Security Act of 2007 (HR6).

Warranty: All equipment, fixtures and materials furnished and installed shall be guaranteed against defect in workmanship and material. All repairs and replacements which may have become apparent and necessary by reasons of such defects, during the first year after final completion and acceptance of equipment installation, shall be made without cost and expense to the Owner. All such repairs and replacements shall be made at a time and during hours satisfactory to the Owner.

EARLY CHILDHOOD LEARNING CENTER BASIS OF DESIGN (SCHEMATIC DESIGN PHASE)

INTRODUCTION

The Schematic Basis of Design (Design Criteria), as described herein, generally summarizes the design intent of materials and systems included in the Schematic Design cost estimate. The materials and systems may change as the project progresses, to meet the project design requirements and budget. The criteria include items known to be Wenatchee School District standards, and initial design intent responses.

A. ARCHITECTURAL

Site: The architectural site features generally include site amenities that supplement the work described below for civil and landscape.

1. Site Features (Shared with Washington Elementary School)
   a. Soccer Field: Approximately 135'x280' or longer.
   b. Garden spaces for science and other programs.
   c. Paved covered play area.
   d. Paved outdoor play area.
   e. Accessibility to all activity spaces.
   f. Chain link fence around entire playground and field areas. There may also be sections of decorative metal fencing at key areas.
   g. Playground equipment as noted below.
2. Parking / Service
   a. On-site parking; include ADA spaces as required by code, with a goal of 90 to 100 spaces. (If it is determined that WSSP Credit S2.3 'Minimize Parking' is to be attempted, preferred parking must be provided for carpools, vanpools or alternative fuel vehicles. 5% of the allotted student/staff parking must be set aside for this preferred parking. Complete parking capacity must not exceed local codes.)
   b. Fire truck and emergency vehicle access within 150 feet of all portions of the building perimeter and shall meet City of Wenatchee Fire Department standards for slopes and turning radii.
   c. Lighting at parking lots and other key locations in accordance with the City of Wenatchee Zoning Code. Also refer to WSSP Credit S5.1 for light pollution reduction requirements.
   d. Service yard area with recycle container and trash container.
3. Architectural Site Amenities
   a. Flagpole
   b. Benches
   c. Building identification sign
   d. Pedestrian and vehicular code and way finding signage
   e. Sustainable signage
   f. Bike racks and skate board racks will be distributed near monitored entry points around the building.

Building: The building is existing one story slab-on-grade building of Type V-B (non-rated construction). The building is made up of the original 1959 structure and an addition in 1978 to the west. The building is wood framed on the interior with exterior walls of CMU (1978 addition) and brick masonry (1959 building). The original 1959 building addition has a low slope BUR roof with glu-lam beams and wood deck exposed to the

interior. See the structural section for a description of anticipated building structural systems. The 1978 building has a low slope roof with open web wood joists and a BUR roof system.

1. Exterior Wall System: The exterior wall systems of the ECLC include the following:
   a. 1959 Building: The existing exterior walls are 6" nominal un-insulated brick to a height of 8'-3". Above the brick is 2x4 wood studs with sheathing, finish and 2"batt insulation to the underside of the roof glu-lam beams or wood roof deck.
   b. 1978 Addition: The existing exterior walls are painted 8" CMU with 2x2 furring at 16" O.C with 1 1/2 inches of rigid insulation on the interior side.
2. Exterior Wall Finishes:
   a. Masonry Exterior walls: Existing brick masonry walls will be cleaned, repointed as needed and re-sealed. Existing CMU masonry walls will be cleaned, repointed as needed and re-painted.
   b. Cement Board Panel Siding: Existing cement asbestos board located above the masonry on both portions of the building will be abated and replaced with cement board panels.
   c. Exposed Steel: Any exposed steel will be painted with high performance paint coating.
3. Roof System: The existing roof on both portions of the building will be removed down to the existing wood deck. New plywood sheathing per structural will be added and a new single ply roof system will be installed. Single ply roof system will consist of a new vapor barrier over the plywood sheathing, R-30 or higher insulation (5" minimum), protection board and a glu-down single ply roof membrane and new metal flashing gutters and downspouts.
4. Windows: All existing exterior windows will be removed. New insulated aluminum storefront and unit windows will be installed.
5. Floor Finishes:
   a. Corridors: Rubber tile
   b. Classrooms: Rubber tile
   c. Office Areas: Carpet
   d. Storage and Work Rooms: Rubber tile or VCT
   e. Restrooms: Ceramic Mosaic Tile.
   f. Health Room: Sheet vinyl or sheet rubber.
   g. Multipurpose Room: Rubber tile
   h. Mechanical / Electrical / MDF / Custodial rooms: Sealed concrete
6. Interior Wall Finishes:
   a. Painted Gypsum Board: At all walls unless specifically noted for a special finish.
   b. Vinyl Wall Covering (VWC): Used as both a wall finish and tackable surface where budget allows. Assume VWC will be used at two classroom walls and classroom corridor walls above this wainscot.
   c. Ceramic Tile Wainscots: Assume 5 feet tall at all restrooms.
   d. Wainscot: Three feet high at public and classroom corridors, hallways and stairs over gypsum wallboard. Assume MDF.
7. Interior Ceiling Finishes:
   a. Suspended 2'x4' Acoustical Panel Ceilings: At east / west corridor of 1978 addition.
   b. Glue-on 12x12 inch tile (existing) at classrooms in 1978 addition. Repair and paint as needed.
   c. Painted Gypsum Board: At restrooms.
   d. Exposed stained wood structure (beams and decking) where indicated on drawings; generally at most spaces within the original 1959 building.
   e. Exposed, unpainted structure: Mechanical and electrical rooms.
   f. Special Finishes: As the budget allows, other finishes may be identified for specific locations such as main north-south corridor, library, administration waiting area, etc.

8. Doors and Frames:
   a. Interior Doors and Frames: Solid core, wood veneer doors and hollow metal fully welded frames with high performance coating.
   b. Interior Relites: Hollow metal fully welded frames with high performance coating.
   c. Exterior: Heavy duty aluminum doors in storefront / curtain wall systems for primary entrances. Galvanized hollow metal doors and frames at secondary/service entrances with high performance coating.
   d. Hardware: Commercial grade hardware to match district standards. Fully mortised locksets.
9. Cabinets and Casework: Plastic laminate faced commercial grade casework.
10. Specialties: Metal mini-blinds at windows, magnetic marker boards, tack boards, projection screen brackets, fire extinguishers, toilet partitions, stainless steel toilet accessories, and other specialties as appropriate.
11. Display cases in public spaces.

Sustainability: The ECLC is an existing structure that will undergo significant improvements. If the improvements are funded by the State of Washington and the cost of these improvements exceeds 50% of the assessed value of the structure then the newly renovated building will need to meet the high performance requirements as prescribed in the WSSP. A design team and owner workshop was held on June 19, 2014 to determine the WSSP points the ECLC can achieve with the present design. The Wenatchee School District is a class I district for the purposes of determining WSSP requirements. This will require the ECLC to achieve a minimum of 45 points. Based on the schematic design workshop results, the ECLC is capable of achieving 31 points with another 57 points that "might" be achieved depending on the development of the design and existing conditions. However, during the workshop it was determined that some of the "required" WSSP points may be difficult to achieve without significant cost and program impacts. The Wenatchee School District will need to determine whether State funds will be used to fund the renovations at the ECLC before a final determination by the State can be made whether this building will need to comply with WSSP requirements.

B. Civil

Fire Protection: Per hydraulic modeling, the existing City water system capacity is approximately 2,100 gpm in the 6" main in Elliot and 4,000 gpm in the 8" main in Washington. There are three existing hydrants on Elliot. Field flow testing to check model accuracy has not been performed. System pressure ranges from 48 to 60 psi.

Per a preliminary discussion with the City Fire Marshal in March 2014, he stated that the fire flow requirement might be 8,000 gpm with a 75% reduction for sprinklers, or 2,000 gpm. This will have to be revisited once the building design is farther along.

There needs to be a hydrant within a reasonable distance of any fire department connection, assuming 100 feet for now. Hydrant spacing so that any point of the building is within 250 feet of a hydrant, as the hose lays.

The fire line size to the buildings has been stated to RH2 by Hargis as 4" for the ECLC building and 6" for the School District. RH2 has not received any flow requirement values so that we may review sizing.

In April 2014, the City stated the on-site mains should be looped and would be owned by the City. In July, the City revised this to state the on-site mains should be private. Each building should have a separate connection. The City has stated that the fire systems will require double check valve assemblies, and those may be located

within the mechanical rooms. Whether additional backflow device(s) at the property line for the on-site mains serving on-site hydrants will be required has not specifically been discussed.

Domestic Water Service: RH2 has not received information regarding building water use. Receipt of fixture counts or peak water use will help for meter and service line sizing. For now, we are assuming a 4" diameter service line for the Elementary School, 2" for the ECLC building, and 2" for the future portable units.
Per the City, each domestic service will require a reduced pressure backflow assembly (RPBA). These may be located within the mechanical rooms.
We assume the domestic meter(s) should be located within public right of way, preferably in the sidewalk or a planter area, not in a traffic location.

Sanitary Sewer System: The sanitary sewer system will be designed to maintain gravity flow in accordance with the Department of Ecology Criteria for Sewage Works Design (Orange Book) August 2008. The system will discharge into an existing manhole on the City's existing main on Washington St. The existing sewer line will be removed at the completion of the new line. A short section of sewer main connecting into the ECLC building will be reused and tied into the proposed sewer improvements.

Stormwater System: The stormwater system will be designed to discharge at a rate not to exceed the current peak discharge rate. The system will be modeled using the SCS Type 1A rainfall distribution with assignment of 2.04 inches for the 24-hour, 25-year storm event based on the City's Comprehensive Stormwater Plan. It is anticipated that the stormwater system will be in a closed system potentially under the parking lot with an overflow to the City's system. Basic treatment will be provided in accordance with the Stormwater Management Manual for Eastern Washington. The City also indicated that it is acceptable to tie the roofs drains directly to the City's system.

Road Improvements: The City indicated that they would like to see ADA improvements on the NW, SW, and SE quadrant of Washington St. and Elliott Ave. They would also like to see ADA improvements on the NW and NE quadrant at the south end of Elliott Ave. They would prefer to see the existing mid-block crossing removed on Elliott Ave. unless there is an overriding reason why it should remain. The entrances to the school should be driveway approaches as opposed to directly tying the asphalt bus pullouts to the existing street. If possible, they would like to see a buffer placed between the pullout and sidewalk on Elliott Ave. similar to what is proposed on Washington St. AutoTurn templates will be used to determine bus off-tracking on the driveway approaches to ensure sufficient widths. The sidewalk on Washington St. may wrap down along the bus approach to allow pedestrians to cross behind the bus pullout.

C. LANDSCAPE

Design Intent: The overall goal of the landscape will be to create open space and outdoor activity space for the students. To the east along Elliott Avenue façade plantings will be provided to soften the entrance to the school and to create a park like feel as you approach. A barrier free built outdoor play area is provided to the south. Permanent irrigation will be provided to all landscape and field areas for establishment.

Landscaping: Landscape areas will consist of mainly native and drought tolerant landscape plant material with an emphasis on low water use. Low growing plants will be used to maximize the security of the property by allowing only visual separation while maintaining sight views from the street to the building. The landscape design shall utilize the principles of CPTED. Traditional improved lawn areas will be minimized (except for the

open play/ sport field) and meadow areas utilizing low growing, drought tolerant/native grasses will be incorporated to limit maintenance and water use.

Irrigation: Irrigation will be a combination of micro spray pop ups and rotors that will minimize the use of water.

1. Irrigation, although permanently installed, will be controlled to maximize the efficiency of the system during the plant establishment phase and may be phased out over time.
2. For long term irrigation needs the use of a smart controller, evapotranspiration data and rain sensor will be used to continually update the controller's program as seasonal needs change to reduce water waste.
   a. Reduction of irrigation by 50% of the landscape budget baseline will procure 1 point for WSSP Credit W1.1.
   b. If the maximum-allowed 2 points are desired for this Credit, the landscape plan would need to use native plants and/or plants that would not require irrigation beyond the two-year plant establishment period. Consideration of how this would affect the sports field/open play areas should be reviewed.
   c. If temporary irrigation is to be removed after the two-year establishment period (to ensure that irrigation is not used beyond two years) this stipulation should be included in the specifications for the landscape subcontractor.

D. Structural

Design Intent: The building is an existing, one-story building that was constructed in two phases. The original building was constructed in 1958 and is primarily wood frame construction with lightly reinforced masonry walls. In 1978 an addition was constructed with wood framing and reinforced masonry walls. The building and all additions will conform to Type V B, non-rated construction. The scope of work includes the addition of a small office area and an entry vestibule. The additions will be wood frame construction that will be supported on conventional concrete foundations. Modifications to the existing building are also planned, with infill of existing openings, construction of new openings and supplemental framing to accommodate new equipment. Elements of the existing building were constructed under previous versions of the building code thus they are not in compliance with current code. The scope of work includes remediation of non-compliant elements, most of which are related to seismic forces. Specific modifications include the addition of redundant support for beams that are supported by lightly reinforced masonry walls, improvement of roof diaphragm chords, addition of seismic collectors, improvement of wall-to-roof anchorage, addition of plywood shear walls, and addition of backing walls to support partial-height CMU walls.

Design Criteria:

1. All methods, materials and workmanship shall conform to the 2012 *International Building Code.* Design loads shall be determined from ASCE 7-10 *Minimum Design Loads for Buildings and Other Structures.* Loads are as follows:
   a. Risk Category: III
   b. Roof snow load: Determined based on ground snow load equal to 56 psf
   c. Wind: 115 mph Exposure C
   d. Seismic: Ss = 0.476g, S1 = 0.201g
   e. Foundation: to be determined

Foundations:

1. Conventional concrete spread footings and continuous footings. Footings will bear at or below frost depth as determined by the geotechnical analysis. Minimum footing width is expected to be 18" for continuous footings and minimum spread footing sizes are expected to be 3 ft. x 3 ft.
2. Four-inch concrete slab-on-grade floors with 6x6 W1.4xW1.4 steel welded wire reinforcing at typical floors.

Exterior Wall Framing:

1. Typical framing for new walls: 2x6 studs at 16" on center at the exterior walls.
2. The exterior walls will be sheathed with 15/32" Structural 1 plywood sheathing.
3. Existing exterior walls at the original 1958 building are 6" brick with minimal reinforcement. At the north and south walls the existing brick walls are bearing walls, and the walls extend nearly to the roof level. To improve out-of-plane stability for the walls new 2x6 stud walls will be constructed adjacent to the brick walls, and the brick walls will be anchored to the new stud walls. The east and west walls are brick walls that generally stop at the sill height, and the walls are not bearing walls.
4. Existing exterior walls at the 1978 addition are reinforced CMU walls. Around the multi-purpose room the walls are full height CMU. At the classrooms the north and south walls are CMU that extend nearly to the roof framing, and there is a glulam beam on top of the CMU wall. The interface between the CMU and the glulam beam creates an unresolved knuckle. This will be corrected with HSS columns spaced along the wall and anchored to the wall. At the classrooms the east and west walls are full height CMU walls. The CMU walls that extend to the roof are not adequately anchored to the roof to resist seismic forces, so the anchorage will be improved.
5. Infill of existing openings will be constructed with brick, CMU or wood framing to match the adjacent construction.
6. New openings in existing walls will be cut through brick and CMU, and supplemental steel lintels and jambs will be added as needed.

Interior Wall Framing:

1. Typical framing for new walls: 2x6 studs at 16" on center.
2. Existing framed walls occur in the buildings. Several existing walls will be sheathed with 15/32" Structural 1 wood panel sheathing to create new shear walls.
3. At the 1958 building the existing corridor walls are partial height, lightly reinforced brick walls. These walls are bearing walls. To improve out-of-plane stability new 2x6 wood stud walls will be constructed adjacent to the brick walls, and the brick walls will be anchored to the new stud walls.
4. At the 1978 building the existing interior walls are primarily wood stud walls, although the north wall of the multipurpose room is a CMU wall. The CMU wall extends to the roof, where the anchorage to the roof will be improved.

Roof Framing:

1. Roof Sheathing: 5/8" Structural 1 plywood sheathing at all new areas of roof framing.
2. Typical Roof Framing: 2x12 wood joists or wood I-joists.
3. At the 1958 building the existing roof framing is 3-in. T and G wood decking spanning to glulam beams. The glulam beams span in the north-south direction. Portions of the existing decking extend past the exterior walls to create overhangs. At a number of locations there is damage and decay in the wood decking and beams, and at these locations they will be removed and replaced. To improve the roof

diaphragm 3/8-in. plywood sheathing will be applied over the top of the existing decking. The diaphragm chords will be improved with the installation of continuous steel straps along the east and west walls.

4. At the 1978 building the existing roof framing is 5/8" plywood sheathing over wood I-joists at 24" o.c. The roof diaphragm chord and collectors will be improved with the addition of steel straps and angles.

Lateral system:

1. Lateral forces for the building will be resisted by plywood roof diaphragms which will transmit forces to plywood-sheathed and CMU shear walls.
2. New plywood sheathed shear walls will be added to the 1958 building.
3. Existing brick and CMU walls will be improved for out-of-plane stability and anchorage.

E. MECHANICAL

Design Intent: The design intent for the mechanical system is to maximize energy efficiency and provide systems to the meet the unique needs of each space in the building. Systems will be designed in accordance with Wenatchee School District Building Standards.

Applicable Codes and Standards:

The mechanical design shall meet, but not be limited to, the following codes:

Washington Sustainable Schools Protocol (WSSP)
International Building Code (IBC)
International Mechanical Code (IMC)
International Fuel Gas Code (IFGC)
International Fire Code (IFC)
Uniform Plumbing Code (UPC)
Washington State Energy Code (WSEC)
National Fire Protection Association (NFPA)

The mechanical design shall meet, but not be limited to, the following standards:

ASHRAE Standard 52.1 – Gravimetric and Dust Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter
ASHRAE Standard 55 – Thermal Comfort
ASHRAE Standard 62.1 – Ventilation for Acceptable Indoor Air Quality
ASHRAE Standard 90.1 – Energy Standard for Buildings Except Low Rise Residential
SMACNA – Sheet Metal & Air Conditioning Contractors

Design Criteria

Table 1- Outdoor Design Temperatures

Design Season	Temperature
Outdoor Winter DB	6.1°F*
Outdoor Summer DB	95.7°F*

*Values taken from 2013ASHRAE Handbook Fundamentals, 99.6% Heating DB and 1% Cooling DB for Yakima, WA which is the most similar climatic design information available..

Table 2- Building Envelope

Building Envelope	U-value	Component Description
Exterior Wall	0.03	Metal stud framed wall 16" OC with R-25 batt insulation in cavity and R-11 continuous rigid insulation at exterior of stud
Glazing	0.38	SHGC = 0.40

Exterior Door	0.37	Hollow metal door, insulated core
Roof	0.032*	R-30 continuous rigid insulation above deck
Perimeter Slab Insulation	F=0.57*	R-10 rigid insulation with thermal break

*Values taken from 2012 WSEC default values.

Testing, Adjusting, and Balancing: The contractor will be required to hire an independent Balancing Agency (holding current certification from the National Environmental Balancing Bureau or from the Associated Air Balance Council) subject to approval by the Owner. The balancing agency shall have minimum three successfully completed projects of similar size and complexity in the last five years.

Commissioning: The mechanical and plumbing systems will be commissioned by independent Commissioning Agent experienced with minimum three successfully completed projects of similar size and complexity. Mechanical systems will be commissioned in accordance with the Specifications (including Function Performance Testing of components as well as systems) to be provided by Commissioning Consultant hired by the Owner.

Plumbing Systems:

1. Utilities: The mechanical systems will be connected to site water, fire and sewer services designed by the civil engineer. Connection will be at 5'-0" outside of the building. All roof drainage will be exterior to the building and will be picked up by the site work contractor and connected to the storm drainage system designed by the civil engineer.
2. Water Service: The main building water service will enter the building into the mechanical room on the west end of the building. The service riser and backflow preventers will be located in this space and will separately serve the domestic cold water systems, domestic hot water systems, and hydronic heating/cooling system. Water piping services throughout building will be lead-free soldered or brazed type L copper piping.
3. Irrigation: The water service for landscape irrigation will not enter the building and will be covered under the Landscape consultant's scope of work.
4. Domestic Hot Water System: A Natural gas fired high efficiency domestic water heater will be located in the mechanical room depending on final concept. Proposed basis of design shall be Lochinvar. The heater will supply domestic hot water to the entire facility. The domestic water heater will be designed with hot water recirculation piping and pumps to keep hot water available at fixtures.
5. Plumbing Fixtures: All plumbing fixtures will be selected for use appropriate to area of installation. Fixtures will be selected in coordination with the Owner and Architect as the design progresses. In general, low-flow fixtures will be selected to reduce water consumption. Water closets will use high capacity carriers with battery powered automatic flush valves unless otherwise directed. Emergency fixtures will be provided in Classrooms and Shop spaces as required. Wall hydrants will be provided in multi-fixture toilet rooms.
6. Sanitary Waste and Vent System: A sanitary waste and vent system will be installed to serve all fixtures within the building. Piping shall be cast-iron with no hub fittings. Specialty sanitary waste and vent system components will include and oil/water interceptor for all drains in the Auto Tech. area. Electronic trap primers will be provided for all floor drains, funnel floor drains, and floor sinks.
7. Natural Gas System: The use of natural gas is not anticipated.

Fire Sprinkling System: The building will be completely sprinkled with wet system coverage in conformance with NFPA 13 and local AHJ requirements. The design will include a wet pipe system to serve all interior

occupied areas and combustible void spaces. Wet system piping shall be black steel with threaded or mechanical grooved joints. Where design coordination allows, building overhangs will be protected with dry sidewall heads off the wet system. A dry system will be provided to cover large building overhangs as required by the AHJ. Dry system piping shall be galvanized steel. Concealed heads or head guards will be provided at all sprinkler heads subject to damage.

The fire sprinkler service entrance to the building will be located within the main mechanical room plant space with direct access to the building exterior.

Fire system backflow prevention will consist of a double detector check valve (DDCV) assembly located inside the building in conformance with local AHJ requirements. A fire department connection and post indicator valve will be located on site with a separate service line and point of connection outside of the building to serve these devices by Civil.

Heating, Ventilating and Air Conditioning System:

1. Heating Ventilation and Air Conditioning Systems:
   a. Classrooms/Administration: All zones in the building will be served by either packaged rooftop DX heat pumps with Aux. electric heat or split system DX fancoil/condensing units with electric heat. All systems will have airside economizers in accordance with WSEC. Both options are being studied through Schematic Design for cost and architectural impact comparison with system selection occurring in early DD.
2. Exhaust Systems: Dedicated outdoor air system fans will handle exhaust air for custodial rooms and toilet rooms adjacent to classroom wings. Dedicated exhaust fans will serve the custodial and toilet rooms in other areas and will also serve the kitchen hood and dishwasher. Exhaust fans will also be provided to handle heat gain from electrical closets, IDF and boiler room spaces. Fans will be direct drive type with speed controller.
3. MDF Room Cooling Units: Split system air conditioning units will provide separate and independent means of cooling these spaces.
4. Ductwork: Ductwork system shall be galvanized sheet metal throughout and installed per SMACNA standards based on specified pressure classification.

Energy Management and Control System (EMCS): The mechanical systems in the building will be controlled and monitored by a direct digital energy management control system with BACnet interface and web-based capability. In addition to controlling the mechanical systems, the controls will be capable of monitoring and controlling other systems in the building such as energy metering and lighting controls. The control system will interface with the existing central control system located at Pioneer Middle School. Basis of design shall be Automated Logic.

F. Electrical:

Site Work:

1. Trenching for various electrical systems including:
   a. Underground primary service laterals for power distribution.
   b. Underground secondary service laterals for power distribution.
   c. Underground feeders for site lighting.

d. Underground low-voltage services.
e. Underground low-voltage pathways between buildings, including fire alarm cabling.

12. Concrete pads and vaults for various electrical systems including:
    a. Primary electric utility transformer.
    b. Electrical and low-voltage vaults for future portables.

Power Distribution System:

1. Service:
    a. The existing primary electrical service to the existing utility transformer along South Elliot Ave will remain in place. The existing 208V utility transformer and pad are to remain, but new secondary feeders will be installed to a new 208V switchboard.
    b. The existing service voltage is 208V. The replacement switchboard will be provided at 208V as well so that existing panelboards throughout the facility can be reconnected without the installation of step down transformers.
    c. Service equipment shall be a switchboard, suitable for service entrance with copper busing and a main circuit breaker. No primary metering or switching shall be provided.
2. Distribution:
    a. The distribution system shall be configured in a radial fashion with feeders from the main switchboard serving panels in the classroom wings and administration areas.
    b. Branch circuits for computer/receptacles, lighting, and mechanical loads shall be connected to separate panelboards. All loads will be served at 208Y/120V.
    c. Feeder circuits shall be in the building structure or under the building slab using concealed conduit with individual conductors.
3. Emergency Distribution System:
    a. The emergency distribution system for emergency lighting will consist of wall-mounted "bug eye" type fixtures and in some cases, dual-purpose exit signs with integral "bug eyes" to limit device quantities.
4. Branch Panelboards:
    a. Panelboards shall be 208Y/120V, three phase, four wire. They shall have multiple sections where required. Multiple section panelboards shall be the same size and type. Panelboards shall be copper bus, bolt-on circuit breakers with full neutral and grounding bar.
    b. Panelboards shall be surface-mounted in service areas such as electrical rooms, mechanical rooms, and unfinished spaces. Panelboards in finished spaces shall be flush-mounted.
    c. Panelboards shall be specified with transient voltage surge suppressors on each computer panel.
    d. Panelboards shall be specified with 25% space and 25% spare breakers.
5. Branch Circuits:
    a. Branch circuits shall be installed above grade using concealed conduit with individual conductors.
    b. Branch circuits shall be run with a dedicated neutral conductor for line to neutral loads.
    c. Branch circuits shall be a minimum of 20 amperes (#12 AWG) stranded wire.
6. Convenience Outlets:
    a. Receptacles shall be located on approximately ten-foot centers in classroom areas (not including computer stations), and approximately on 50-foot centers in corridors. Office areas will have at least one outlet on each wall. Exterior receptacles shall be located at HVAC units and in service areas for equipment.

b. Outlets shall be alternated on circuits to avoid adjacent receptacles being served on the same circuit. Receptacle outlets shall be limited to four or five per circuit. Computer outlets shall be limited to 2 or 3 per circuit.
c. Dedicated circuits shall be provided for District-designated equipment such as refrigerators, microwaves, copiers, laminators, and similar loads.
d. Surge protection will not be provided on individual receptacles.

7. Grounding:
   a. A grounding system consisting of a continuous equipment grounding conductor will be connected to building steel, metal underground water piping, to all equipment ground buses, enclosures, and installed in conduit systems, etc.
8. Metering:
   a. Metering devices will be installed at the main service entrance, as well as each individual panelboard to monitor the power usage by load type throughout the building. This information will potentially be displayed in a graphical format on an interactive touch screen near the building's entrance.

Wiring Materials:

1. Conduit:
   a. Conduit installed above grade shall be EMT. Where subject to damage or moisture, rigid metallic conduit shall be used.
   b. Conduit for underground circuits shall be electrical grade, schedule 40 gray PVC conduit. 90 degree bends and transitions from PVC to EMT shall be with rigid steel sweeps.
2. Conductors:
   a. Service lateral and feeder circuit conductors shall be individual insulated copper conductors. Insulation type shall be THHN.
   b. Branch circuits shall be individual insulated copper conductors. Insulation type shall be THHN.
3. Boxes and Fittings:
   a. Device boxes shall be one piece, deep, non-welded device boxes.
   b. Conduit fittings for all above grade circuits shall be steel, compression fittings.
   c. Conduit shall be attached using one-hole clamps.
   d. Electrical materials shall be attached with wood screws for wood building components, to steel studs using sheet metal screws and to structural steel with beam clamps.
4. Wiring Devices:
   a. Receptacles shall be duplex nylon face, with stainless steel cover plates. Switches shall be heavy duty, twenty ampere. Final color, types, and manufacturers to be confirmed with Owner.
   b. Ground fault interrupter outlets shall be provided in areas subject to moisture, including adjacent to sinks.
   c. Tamper-proof receptacles will be specified throughout a majority of spaces as required by the 2014 National Electric Code.
   d. Wire guards shall be provided on fire alarm, intercom, emergency lights, and security devices in the gymnasium.
   e. Plastic covers or other tamper proof systems shall be provided on fire alarm hand pull stations in corridors or other unsupervised locations.

Lighting System:

1. General: The lighting systems generally shall be designed in accordance with the Illumination Engineering Society's recommendations, and the Washington State Nonresidential Energy Code. Illumination levels in specific areas shall be based on the IES recommended levels for the specific area where these levels can be met while maintaining the lighting power density requirements of the Energy Code for the area use. The IES illumination level recommendations are based both generally on the type of activity, as well as specifically for particular areas/uses in school facilities.
2. Area Recommendations: Lighting recommendations for specific areas are as follows:
   a. Classrooms: Luminaires shall be specified as grid-mounted 2'x2' or 2'x4' LED type. Luminaire types shall be coordinated with the Owner and Architect prior to specifying.
   b. Offices: Luminaires shall be specified as grid-mounted 2'x2' or 2'x4' LED type. Luminaire types shall be coordinated with the Owner and Architect prior to specifying.
   c. Corridors: Luminaires shall be specified as grid-mounted 1'x4' or 2'x4' LED type. Luminaire types shall be coordinated with the Owner and Architect prior to specifying.
   d. Gymnasium: Luminaires shall be specified as fully-enclosed pendant-mounted LED type bowls resembling traditional high bay fixtures. Luminaire types shall be coordinated with the Owner and Architect prior to specifying.
   e. Multipurpose Room: Luminaires shall be specified as fully-enclosed pendant-mounted LED type bowls resembling traditional high bay fixtures. Luminaire types shall be coordinated with the Owner and Architect prior to specifying.
   f. Storage Areas: Fixtures shall be specified as chain-hung or surface-mounted LED strip fixtures. Luminaire types shall be coordinated with the Owner and Architect prior to specifying.
   g. Mechanical Spaces: Fixtures shall be specified as chain-hung or surface-mounted LED strip fixtures. Luminaire types shall be coordinated with the Owner and Architect prior to specifying.
3. Exterior Lighting:
   a. Exterior lighting source shall be LED. The luminaires shall be both pole-mounted and building-mounted.
   b. Exterior Lighting is not to exceed IESNA foot level requirements as stated in the IESNA RP-33 *Recommended Practice for Exterior Environmental Lighting* per WSSP Credit S5.1.
   c. Pole mounted fixtures shall be cutoff style with finish selected by the Architect. Poles shall be anodized aluminum or galvanized steel. Poles shall be 20' to 30' tall, with occupancy sensor mounted at ~20', straight round tapered. Style and finish shall be selected by the Architect.
   d. Foundations shall be cement concrete flush with sidewalks or lawns, except in parking areas where subject to damage in which case the foundations shall be raised thirty inches above grade. Exposed concrete portions of area lighting pole bases shall be finished in exposed aggregate.
   e. Building-mounted lighting shall be primarily used to mark building entrance locations or provide security lighting in areas susceptible to vandalism.
   f. Pole mounted lighting shall be used to illuminate parking and traffic areas.
4. Exit/Emergency Lighting:
   a. Exit signs shall be powered, LED type with integral battery packs. Exit sign locations shall be determined by exit path requirements of the International Building Code as interpreted by the Architect/Building Official.
   b. Wall-mounted "bug eye" type emergency light fixtures with integral batteries will be located throughout the facility to meet the minimum egress lighting requirements defined in the IBC.

5. Lighting Controls:
   a. With the exception of corridors, local switches will be provided in each space within the facility. The switches shall be located adjacent to the entrance to the space. Where there is more than one entrance to the space, lighting system controls may be provided at each entrance.
   b. The lighting system in each classroom shall utilize recessed light fixtures with integral photocells and occupancy sensors. Each light fixture will harvest daylight per the WA State Non Residential Energy Code. Switches within each classroom shall utilize a standard wireless protocol to communicate with each fixture for on/off functionality as well as scene and dimming control. Luminaires shall be manually turned on and will turn off automatically per the 2012 WA State Energy Code.
   c. The lighting system for the corridors, mechanical spaces, and common areas will be switched remotely by relays and controlled by schedule through the energy management system.
   d. Exterior lighting will be switched remotely by relays and controlled by schedule through the energy management system as well.

Telecommunication Systems:

1. Telecommunications Grounding System:
   a. The telecommunications grounding system shall provide an equipotential between telecommunications spaces for the protection of sensitive electronics and to reduce the possibility of interference in the transmission of digital signals throughout the facility. Entrance protection and 110 cross-connect wall fields will be provided for the termination of voice backbone cabling and voice cross-connects and shall be connected to the grounding system. Each telecommunications room will be provided with a dedicated telecommunications grounding busbar and connection to building ground. Equipment racks and components shall be bonded to the telecommunications busbar and all telecommunications busbars shall be connected with a common telecommunications bonding backbone.

2. Telecommunications Raceway:
   a. Pathways to support horizontal cabling will consist primarily of open cabling methods. In some areas where no accessible ceilings exist, conduit pathways will be utilized. Workstation devices will consist of a dedicated 1 inch conduit to a 4-11/16 inch square outlet box with a single gang plate at a minimum stubbed up into the ceiling space.
   b. Interbuilding conduit pathways will consist of (1)4" – Telco Demarc, (1)2" – District WAN, (1)2" – Cable TV and (2)4" – Washington Elementary School underground conduits from the property line to the TR-MC. The district's WAN singlemode optical fiber and other utilities will be extended to the main telecommunications room via underground conduits from the property line. The new conduits shall be encased with 3000 psi rated concrete under vehicular traffic (roadways, drives, parking areas). Conduits shall be sloped towards the street to avoid water infiltration and sealed with inflatable bags.
   c. Intrabuilding conduit pathways will consist of (3)2" – Future Portables underground conduits with a handhole/maintenance hole located near the portable pad.

3. Telecommunications Distribution System:
   a. The copper connectivity and cabling infrastructure shall be a Category 6 system as defined in ANSI/TIA/EIA – 568B, Part 1 and Part 2 standard. The optical fiber connectivity and cabling infrastructure shall consist of both laser optimized multimode and singlemode as defined in

ANSI/TIA/EIA – 568B, Part 3 standard. Supplemental twisted pair copper backbone cabling shall consist of Category 3 multi-pair cabling.

b. Horizontal station cabling shall terminate on modular 48-port patch panels with 8-pin, 8-conductor modules with 110 IDC connections on the back of the patch panel. Optical fiber cabling utilized for voice and data networks shall terminate in rack mount fiber cabinets with SC connectors.
c. The manufacturer for both copper and optical fiber infrastructure shall be an Ortronics/ Berk-Tek solution per the Wenatchee District standard and shall include a performance based warranty for a period of not less than 15 years from the date of installation. Equipment racks, vertical cable management, ladder tray and grounding busbars shall be an Ortronics solution.
d. Structured Cabling (Voice and Data Cabling) will be provided to each classroom and administrative area. The device quantities vary from space to space based upon usage and the quantity of computing devices expected in those areas. The typical classroom will have structured cabling at four locations in each classroom. Additional connections are provided in computer labs and shared spaces. The pathways that have been designed to support this cabling have been sized to accommodate the addition of cabling in the future should future programming require additional network connectivity. Cabling will also be provided to connect wireless access points, classroom AV devices and IP video surveillance cameras.

4. Classroom Audio Visual System:
   a. The classroom audio visual system will provide IR wireless voice reinforcement, and amplified playback of music/media, computer interface, and/or other audio/video program material. The system includes all of the equipment necessary to distribute the audio and video signals from the classroom computer/document camera, wireless microphone, and wireless tablet to the overhead projector and ceiling speakers.
   b. The system can be controlled using a wall mounted controller with individual selector buttons and an overall program volume control. The controller will be located near the entry door as this is a central location between the teaching wall and the back of the classroom. An assistive listening system (kit) will be provided to meet ADA requirements and can be utilized on an as needed base with convenient connections at the teaching location.
   c. Input/ Output plate consisting of HDMI, VGA, Composite, audio input and assistive listening, video projector, Apple TV, cabling, controller, sound enhancement system, and ceiling enclosure will be included.

5. Multipurpose Audio Visual System:
   a. The Audio Visual (AV) system is to be a complete public address system for the pick-up, recording, and amplified playback of music, voice, video and/or other AV program material. The video projector

screen is specified by the Architect. The video projector will be mounted in a protective housing and will be installed on a wall.

b. The AV system consists of front-fired powered loudspeakers and a portable equipment rack containing all AV electronic components, including a 16 channel mixer board. The system is completely portable by connecting to the provided input plate to utilize the installed loud speakers.
c. The portable equipment rack will house a wireless microphone system, assistive listening system and playback equipment.
d. The system will have hard-wired inputs for microphone/aux, HDMI, composite and VGA video at one location. The AV input plates will allow users to show presentations from a laptop, DVD/Blu-ray, tablet or other computing devices to project the content over LCD video projector.

6. Digital Signage System:
   a. The digital signage system will be provided by the owner, the design will provide power and network connectivity only.

7. IP Intercom Clock System:
   a. The system solution is under review by the district, below is what is anticipated to be the solution if an IP based system is desired.
   b. The intercom system will be an IP based system utilizing the Category 6 structured cabling system for IP devices. The intercom system shall use primarily IP intercom speaker digital clock combination units with integrated two-way microphones, optional call button can be utilized if desired. The IP intercom clocks will be powered by the Power over Ethernet switches located in the telecommunications rooms.
   c. Analog paging speakers will be used to supplement the system in common areas, exterior spaces and corridors. The analog speakers are powered by an amplifier and are integrated into the data network by an IP zone controller. Each zone controller can support (1) zone and will be provided as needed in the telecommunications rooms to separate interior and exterior zones.
   d. The system shall be integrated with the Shore-Tel telephony system being provided by the owner via SIP protocol. The system shall be primarily software controlled and configured; it will reside on a network server within the district's IP network, licenses and programming shall be provided by the contractor. Software will be Syn-Apps and hardware will be from Advanced Network Devices (IP Devices) and Atlas Sound (analog speakers). The system shall be accessible from the outside the school via the district WAN or web browser. The system supports audio and text messaging through the intercom speakers and digital clocks for event notification or in an emergency. The audio and text messages can be live or pre-programmed.

Security and Life Safety Systems:

1. Access Control System:
   a. The access control system will provide electronic access control to exterior doors throughout the facility. The electronic access control system will be owned and maintained by Wenatchee School District and integrated into the district wide access control system. Electronically controlled doors shall be centrally controlled from a single management point and shall be configured to open based upon time of day (central clock) or by the presentation of an authorized user credential (proximity card). The system shall be integrated with the intrusion detection system to perform specific functions as noted below. The overall intent of the electronic access control system is to minimize the need for faculty and staff to be issued and use physical keys. All electronically access controlled

doors will be equipped with standard physical key hardware; however keys will be tightly controlled to reduce the likelihood of them being stolen or lost. The system includes long term record retention and customizable reports that can be used by the owner for maintaining the system and for forensic discovery of usage patterns and/or other system issues. The system shall support remote connections as determined by the district for maintenance and configuration from off-site locations. An emergency "lock-down" button will be provided in the main office area that upon activation will immediately lock all exterior doors and will block any time based unlocking until the lock-down button is de-activated.

b. Exterior Door Functionality:
    1. Specific exterior doors will be selected during the design phase of the project to be equipped with proximity readers based upon intended pedestrian routes and the proposed operations of the facility. It will be the responsibility of district to educate and instruct users on the acceptable entrance locations to the facility. Access to these exterior doors will be controlled in several different ways. Main entry doors to the school will be programmed to automatically unlock in the morning and in the afternoons to accommodate typical student access. During the hours where the doors are not scheduled to be unlocked, the doors will remain locked until a valid credential (proximity card) is presented to the card reader. The access control system will also be configured not to automatically unlock the exterior doors unless the intrusion detection system has been disarmed to avoid a condition where the exterior doors are unlocked, but no employees are present. Exterior doors that are not noted as main entry points will be configured in an always locked condition and access will be granted by card read only (not time controlled). Exterior doors not equipped with electronic access control are not intended to be used for ingress (egress only).
c. ADA Auto-Operator:
    1. The normal sequence of operation for an ADA automatic door used with the electronic access control system would be that the electrified door hardware would be unlocked during normal entrance times and the ADA operator button would be enabled for public use. After hours or anytime the access controlled door is locked, the exterior ADA auto-operator button would be disabled. A valid card read (and PIN code when required) when the door is locked would unlock the door and enable the exterior ADA button. The interior ADA button is always enabled (24/7) to unlock the electrified door hardware and actuate the automatic opener for egress purposes. For both entry and exit purposes, there will be a slight delay allowing the door hardware to unlock prior to activating the auto-operator.

2. Intrusion Detection System:
    a. The security system shall provide reliable intrusion detection and transmit an intrusion alarm condition to districts monitoring agent. All school interior corridors, and major areas will be supervised and monitored by the intrusion alarm system to provide full security coverage. Equipment and application will motion detectors to be installed along major corridors and near exterior doorways. Separate security zones with keypads will be created allowing the district to permit usage of the gym and/or cafeteria without compromising the intrusion security for the rest of the facility. A supervisory panel will be provided for status annunciation of the security system.

3. IP Video Surveillance System:
    a. Video surveillance monitoring will be accomplished using IP based video cameras with ExacqVision server based Video Management System (VMS), and connected via the converged data network. Cameras shall be a mix of megapixel cameras, mounted in enclosures or housings suitable for the environment in which they are installed. Cameras shall cover all exterior doors, corridors, common

spaces and exterior spaces including; parking lot, bus turn-around and gathering locations. The storage of image files will be on a server known as a Network Video Recorder (NVR) which can reside and share Washington Elementary School's NVR.

b. Monitoring functions can be supported anywhere with IP connectivity to the school. The system shall be completely scalable to support any number of cameras. The system shall be capable of displaying live or stored video from any network connected device (Computer, PDA, Etc.) provided that permissions are granted, and there will be no limit to the number of viewing clients allowed.

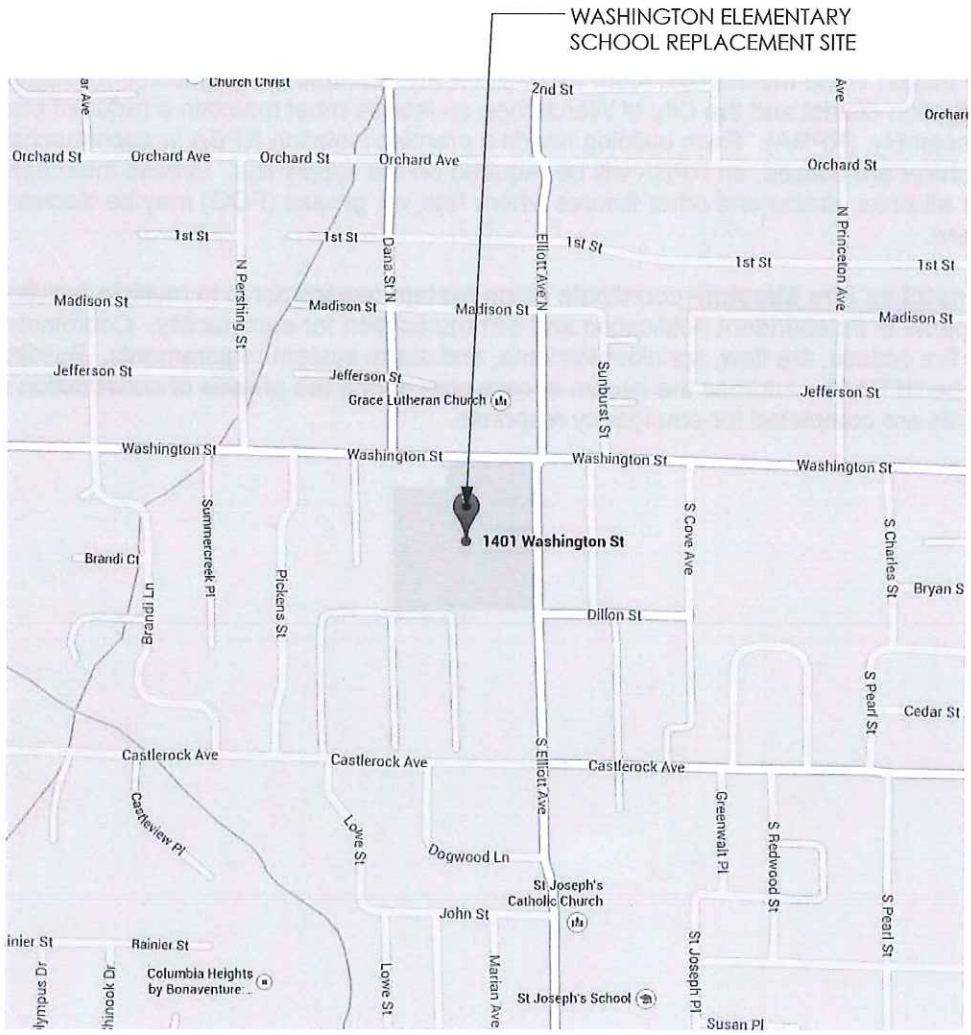
4. Distributed Antenna System:
   a. The distributed antenna system (DAS) will serve the emergency responders in an event of emergency with internal radio communications. It has not been determined if this will be required by the City of Wenatchee/ Fire Marshall at this time.

5. Fire Alarm System:
   a. The fire alarm system shall consist of an addressable fire alarm system with a main control panel, remote control/annunciator panel, graphical annunciator panel, initiating, signaling, and output devices.
   b. The main fire alarm control panel will contain addressable input modules, test circuits, relay modules, the battery backup system, and signaling modules. The panel will be surface mounted to permit access for expansion or additions.
   c. The remote LCD annunciator panel will be located in the main office. The panel will be flush mounted.
   d. The graphical annunciator panel will be located in the main entrance where it is visible from the outside. The panel will be flush mounted.
   e. The initiating devices will consist of code required, manual hand pull stations, heat detectors, smoke detectors, duct smoke detectors, and fire protection sprinkler valve and flow monitor switches. The location and arrangement of these devices will be determined by code requirements. Duct smoke detectors will be provided at the location of mechanical air handlers with air flows over 2000 CFM. Tamper and flow switches will be provided for wet and dry fire protection sprinkler systems. Hand pull stations will be provided at exit locations required by code, flush mounted at forty-eight inches above the finished floor.
   f. The signaling devices will consist of audible/visual horns/strobe combinations in classrooms, with audible/visual horns/strobe combinations in main corridors and common areas, and an exterior 10" bell on the building exterior. Signaling devices will be mounted at eighty inches above finished floor and located near the door in classrooms. Devices may also be ceiling-mounted as allowed by the AHJ.
   g. Outputs will consist of signals to the HVAC unit shutdown relays, and magnetic fire door hold opens, which will be specified under other Divisions of the specifications. These devices will be located at the HVAC unit control location and at doors designated by the Architect or Code Official for automatically released fire doors.
   h. Wiring for the fire alarm system will be installed in a standard "open cable" method. The conductors will be individually insulated copper conductors.
   i. The system will function as follows:
      1. The activation of a manual hand pull device or other initiating device will generate the following:
         a. Sound audible alarm devices and operate visual alarm devices automatically.
         b. Release fire doors to close.

c. In addition to the above functions, actuation of a duct detector will shutdown air handling units in the actuated zone only.

j. The fire alarm system will be powered from normal power and internal backup batteries. The system and will be constantly supervised via an IP-based communications method.

END OF ECLC BOD



VICINITY MAP

NTS

TCF Architecture

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F.253.572.1445
902 North SecondStreet
Tacoma, Washington98403
www.tcfarchitecture.com

TCF Architecture, PLLC

Project Title
WASHINGTON ELEMENTARY
SCHOOL REPLACEMENT

1401 Washington St.
Wenatchee, WA 98801

Project Number
2014-001

Date

Drawn By
PI

Sheet Number
Ac1.01

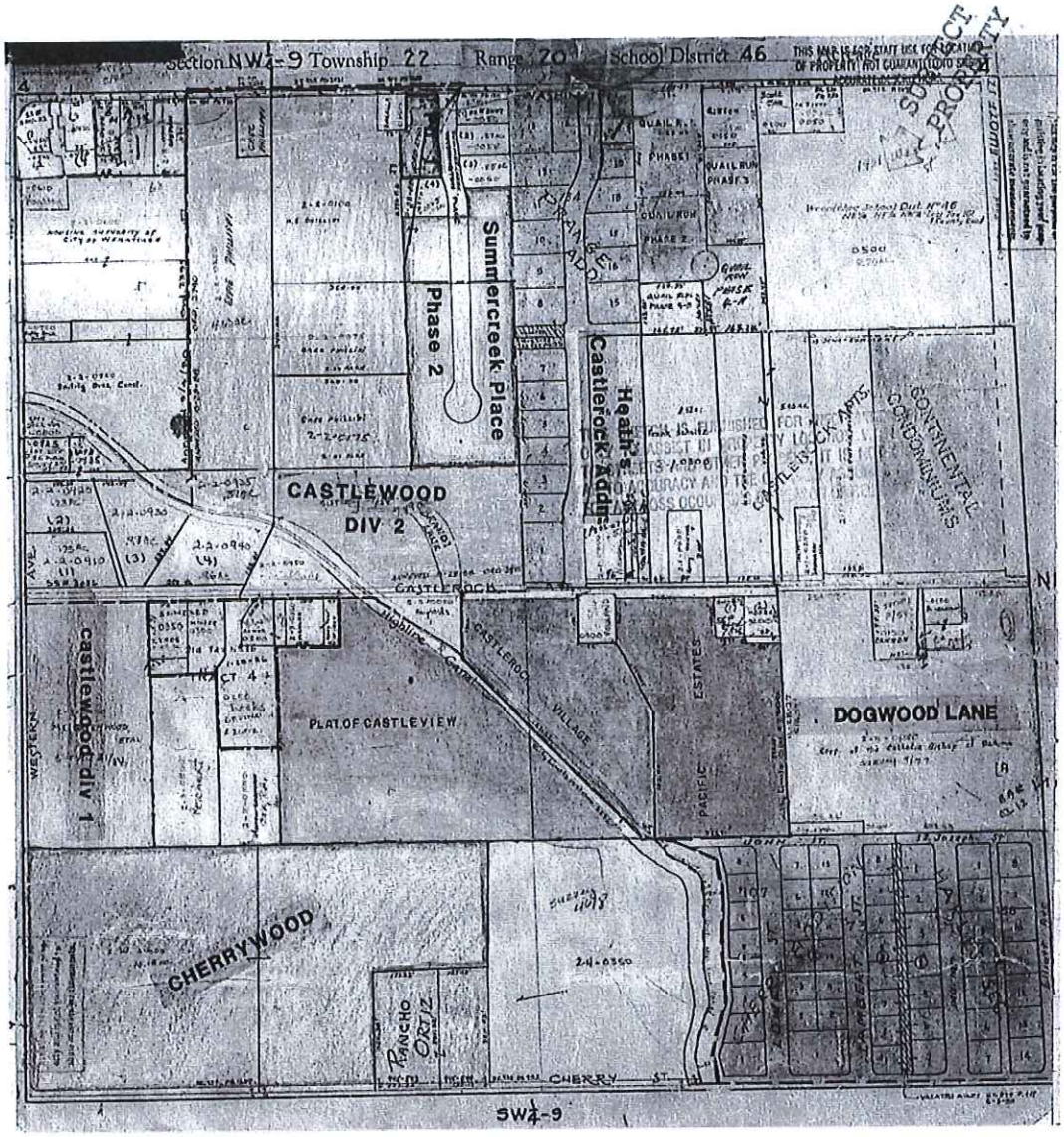


EXHIBIT "A"
LEGAL DESCRIPTION

The Northeast quarter of the of the Northeast quarter of the Northwest quarter of Section 9, Township 22 North, Range 20 East W.M., Chelan County, Washington.

EXCEPT the North 140 feet of the West 233 feet of said Subdivision. EXCEPT right of way of Washington Street.
EXCEPT the North 140 feet of the West 95 feet thereof.
EXCEPT the North 5 feet of the North 140 feet of the West 233 feet of the above described subdivision, as measured parallel with the North line thereof.

LEGAL DESCRIPTION & PLAN

NTS

TCF Architecture
P.253.572.3993
F.253.572.1445
902 North SecondStreet
Tacoma, Washington98403
www.tcfarchitecture.com
TCF Architecture, PLLC

Project Title
WASHINGTON ELEMENTARY SCHOOL REPLACEMENT

1401 Washington St.
Wenatchee, WA 98801

Project Number
2014-001

Date

Drawn By
Author

Sheet Number
Ac1.02

RH2 ENGINEERING, INC
www.rh2.com
mailbox@rh2.com
1.800.720.8052

BELLINGHAM
454 W Horton Rd
Bellingham, WA 98226

BOTHELL
22722 29th Dr SE, Ste 210
Bothell, WA 98021

EAST WENATCHEE
300 Simon St SE, Ste 5
East Wenatchee, WA 98802

GOLD HILL
13677 Highway 234
Gold Hill, OR 97525

RICHLAND
114 Columbia Point Dr, Ste C
Richland, WA 99352

SHERWOOD
18850 SW Parrett Mtn Rd
Sherwood, OR 97410

SILVERDALE
2021 NW Myhre Rd, Ste 107
Silverdale, WA 98383

TACOMA
One Pacific Building
621 Pacific Ave, Ste 104
Tacoma, WA 98402

October 8, 2014

Mr. Terry Bills
TCF Architecture, PLLC
902 North Second Street
Tacoma, WA 98403

Sent Via: *U.S. Mail*

Subject: **Washington Elementary School Modernization Fire Flow Analysis**
City of Wenatchee Domestic Water System

Dear Mr. Bills:

A fire flow analysis for the proposed Washington Elementary School Modernization project located on the southwest corner of Washington Street and Elliot Avenue has been performed for the purpose of determining the available fire flow capacity of the City of Wenatchee's (City's) water system. The water system was analyzed using the WaterCAD® computer model of the City's piping system. Field tests were also performed on August 20, September 10, and September 25, 2014, by Ryan Peterson of RH2 Engineering, Inc. (RH2), Mark Yapel of the City of Wenatchee Fire Department and Tony Sherting from the City. Additional City personnel also assisted during the testing. The required fire flow rate has been determined by the Fire Department to be 1,750 gallons per minute (gpm).

Criteria

To determine the system's capability to supply the required fire flow, the following criteria* must be met.

- Maintain a minimum of 30 psi during peak hour demand conditions.
- Obtain 1,750 gpm fire flow at a residual pressure of 20 psi during maximum day demand conditions.
- Keep pressure at all service connections above 20 psi during the fire flow event. Keep 10 psi in all pipelines at all times.
- The largest source of supply, Jefferson Pump No. 2 is assumed out of service.
- Reservoirs modeled at 8 feet of drawdown to simulate usage during firefighting during a high demand day.

*(Criteria obtained from the following sources: American Water Works Association-*Distribution System Requirements for Fire Protection*; Washington State Department of Health-*Group A Public Water Systems*; City of Wenatchee-*2010 Water System Comprehensive Plan*; and Insurance Services Office-*Fire Suppression Rating Schedule*), WAC 246-293.

System Setup

RH2 has been supplied with a preliminary layout for the site. This layout includes contours. All adjacent elevations within the model have been obtained from City mapping, which has an assumed accuracy of plus or minus 10 feet. Water service for the site is served from the upper zone reservoirs (overflow 1,050 feet) through a series of pressure reducing valves

(PRV) set to a hydraulic grade of approximately 960 feet. The existing water system is shown on **Figure 1**. The PRVs also have pressure sustaining functions, which will throttle the valves and restrict flow if the upstream pressure drops too low.

Under normal conditions, we expect that water pressure in this site will range from 48 psi to 63 psi at site elevations of 815 to 840 feet.

The proposed improvements consist of an on-site dead-end main connecting to the existing 8-inch cast iron main in Washington Street to supply on-site hydrants and the fire sprinkler system for the Elementary School. The south building fire system would be fed from a separate connection to the existing 6-inch cast iron main in Elliot Avenue. The existing mains were installed in the 1950s and their condition is unknown.

A double check detector assembly (DCDA) will be required by the City at the property line. The City's standard is to size the DCDA based on the AWWA maximum rated flow, which is 1,600 gpm for an 8-inch valve and 2,300 gpm for a 10-inch valve. The fire flow requirement is 1,750 gpm, which would require a 10-inch DCDA to meet City standards.

Computer Results

RH2 ran a computer analysis within the site and at existing hydrants along the property perimeter. The lowest on-site flow is projected to be 1,960 gpm at 20 psi. The lowest off-site flow is 2,130 gpm at 20 psi (Elliot parking lot exit). See **Figure 2**.

During these flow events, water velocity is relatively high in numerous mains. Although the City does not have a maximum velocity criteria, we have performed a second series of analyses limiting velocity to no more than 10 feet per second (fps). High velocity dramatically increases the risk of damage due to water hammer. With the 10 fps limit, the available fire flow is shown on **Figure 3**. The resulting lowest on-site flow is 1,566 gpm, and the lowest off-site flow is 1,680 gpm.

Field Results

Field testing was performed to compare with the hydraulic model results. The results of the field test show significantly less flow available than the computer model predicted. We have not been able to determine the reason for the discrepancy. Therefore, we recommend using the field tests for facility sizing.

Test 1: Flow hydrant #1 at Washington and Elliot. Residual hydrant #2 at Elliot parking lot exit.

Static pressure: #1 = 59 psi, #2 = 52 psi.
Residual pressure: #2 = 42 psi (10 psi pressure drop).
Flow rate: Pitot = 25 psi, flow = 839 gpm.
Projected available fire flow = 1,749 gpm at 20 psi.

Test 2: Flow hydrant #2 at Elliot parking lot exit. Residual hydrant #1 at Washington and Elliot.

Static pressure: #2 = 54 psi, #1 = 60 psi.
Residual pressure: #2 = 31, #1 = 50 psi (10 psi pressure drop).
Flow rate: Pitot = 17 psi, flow = 692 gpm.
Projected available fire flow = 1,340 gpm at 20 psi.

Test 3: Flow hydrant #1 at Washington and Elliot, #2 at Elliot parking lot exit, #3 at Washington and Dana. Residual hydrant #4 at Dana and Jefferson.

Static pressure: #1 = 60 psi, #2 = 58 psi, #3 = 56, #4 = 60.
Residual pressure: #2 = 33, #4 = 30 psi (30 psi pressure drop).
Flow rate: #1 Pitot = 13 psi, flow = 608 gpm, #2 Pitot = 8 psi, flow = 475 gpm, #3 Pitot = 15 psi, flow = 589 gpm. Total flow = 1,672 gpm at 30 psi.
Projected available fire flow = 1,895 gpm at 20 psi.

A follow-up test was run by changing the upstream pressure sustaining set point on the 12-inch Washington PRV from 75 psi to 60 psi.

Test 4: Flow hydrant #1 at Washington and Elliot, #2 at Elliot parking lot exit, #3 at Washington and Dana. Residual hydrant #4 at Dana and Jefferson.

Static pressure: #1 = 60 psi, #2 = 58 psi, #3 = 56, #4 = 60.
Residual pressure: #1 = 44 psi, #2 = 40, #4 = 40 psi (20 psi pressure drop).
Flow rate: #1 Pitot = 8 psi, flow = 500 gpm, #2 Pitot = 18 psi, flow = 716 gpm, #3 Pitot = 15 psi, flow = 589 gpm. Total flow = 1,805 gpm at 40 psi.
Projected available fire flow = 2,500 gpm at 20 psi.

Because this is a pressure reduced zone and not fed directly by a reservoir, the standard equations for projecting fire flow at 20 psi are not accurate. They should underestimate the maximum flow available because the PRVs operating during the test are only partially open. With a stronger draw, such as from a pumper truck, the PRVs may open wider resulting in a lower friction factor.

We believe there may be a malfunctioning PRV, a closed isolation valve, or a pipe smaller than mapping shows that is restricting flow to this area. However, there does appear to be sufficient flow to meet the 1,750 gpm at 20 psi flow requirement as long as the Washington PRV pressure sustaining set point is no higher than 65 psi.

If the water system were performing similar to the model, the on-site main could be 8-inch diameter. But since the water system has a much larger pressure drop than the model, the on-site main will need to be 10-inch to provide adequate flow at the end of the main.

Please note that the conclusions reached in this letter address only the technical issues related to obtaining fire flow. The City may have additional requirements related to City policies that must be addressed. If you have any questions, please feel free to contact us.

Sincerely,

RH2 ENGINEERING, INC.

Ryan Peterson, P.E.
Project Engineer

RP/kj

Enclosure: Figures 1, 2, and 3

Figure 1 - Existing Water System

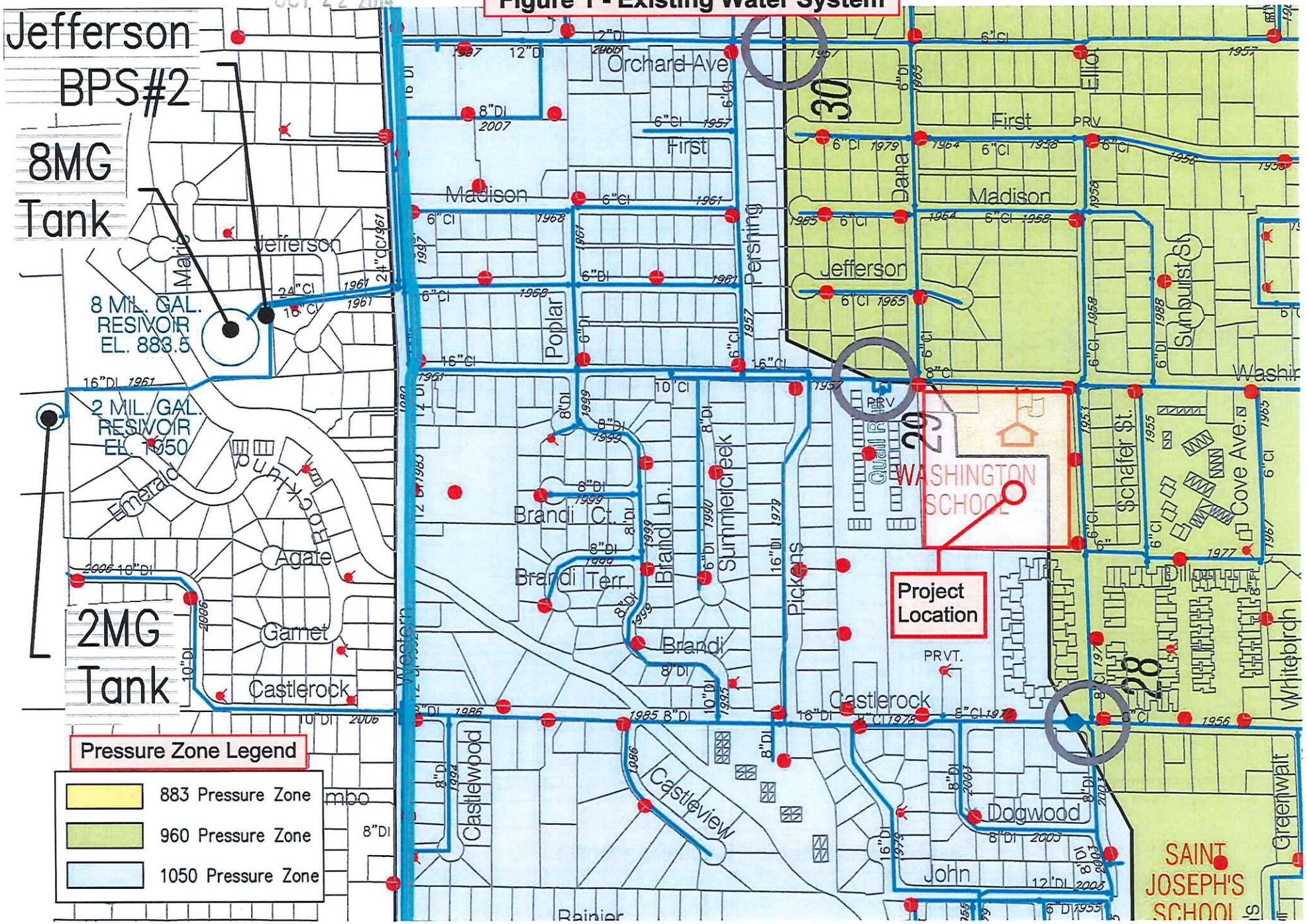


Figure 2 WaterCAD hydraulic model results

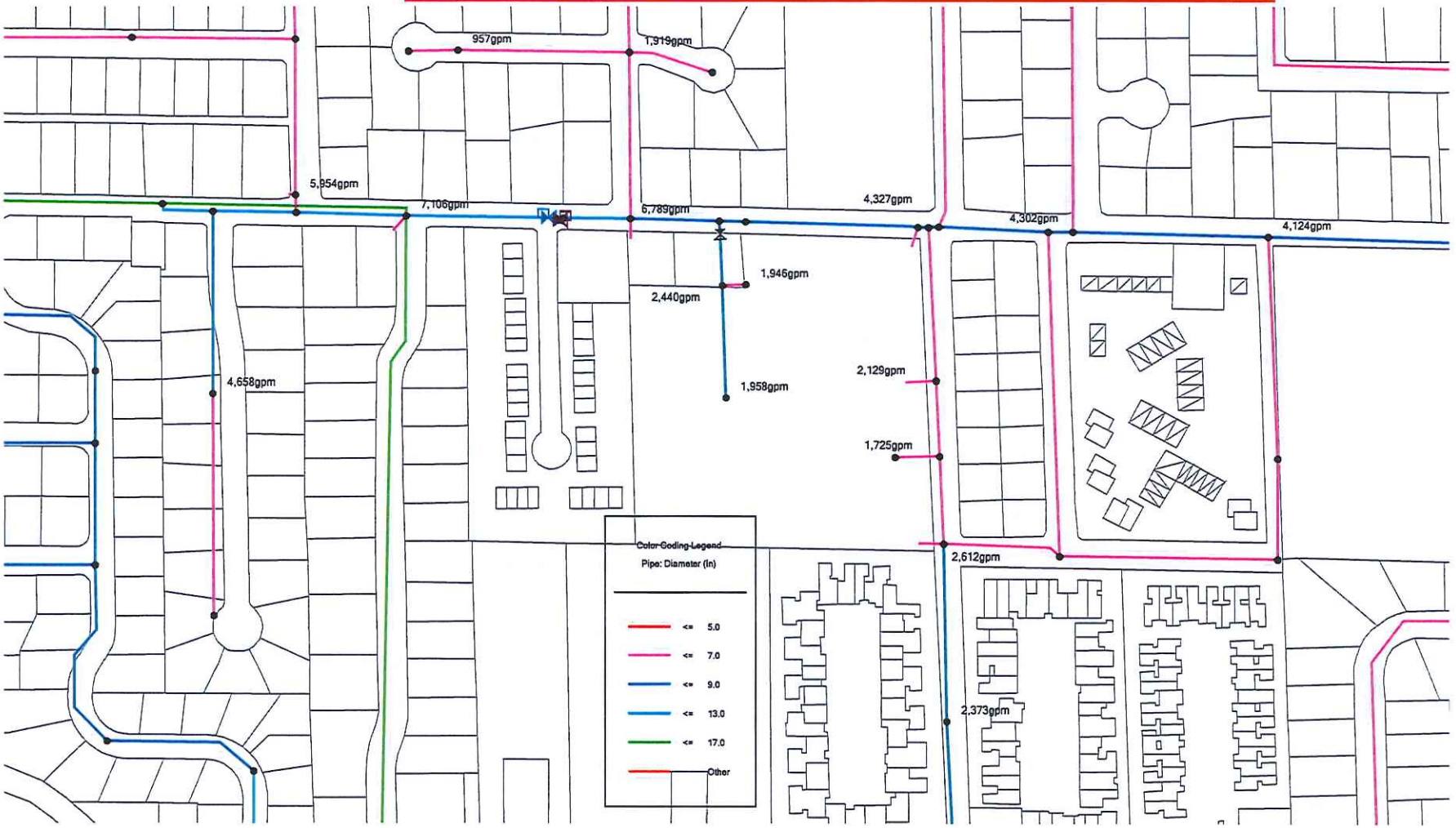
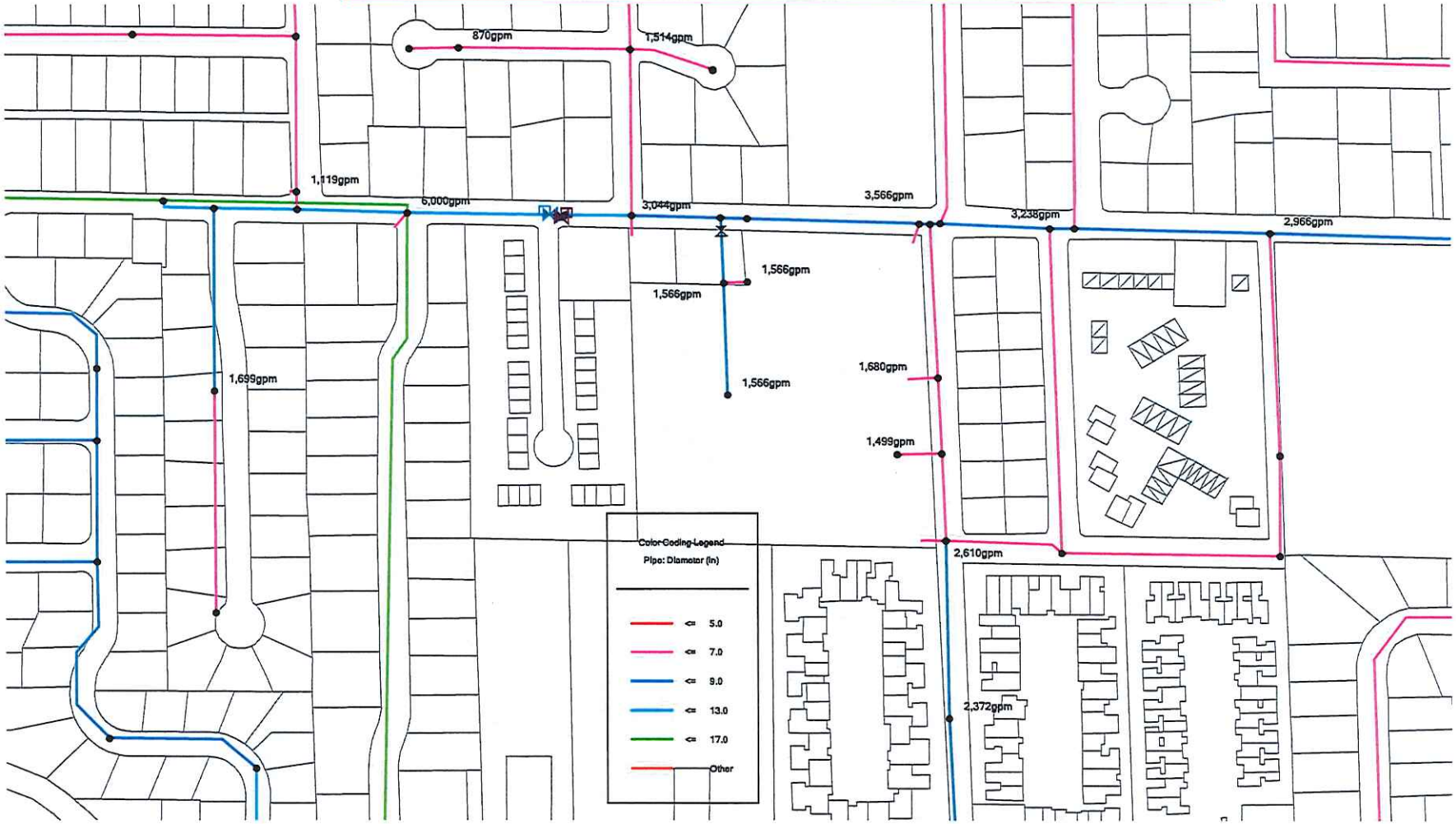


Figure 3 WaterCAD hydraulic model results with 10 fps velocity constraint



wes-mdl.wtg
10/8/2014

Bentley Systems, Inc. Haestad Methods Solution Center
27 Siemon Company Drive Suite 200 W Watertown, CT 06795 USA +1-
203-755-1666

TCF Architecture

October 17, 2014

City of Wenatchee
Community Development

Mr. Glen DeVries
1350 McKittrick Street
Wenatchee, WA

Re: Conditional Use Permit Application – **Modulation Narrative**
Wenatchee School District 246
Washington Elementary School Replacement
& Early Childhood Learning Center Renovation

Dear Glen,

The new Washington Elementary School is designed to meet the intent of WCC 10.48.080 (4) with deviation from this standard only required to provide maximum functionality and flexibility to the educational program within. The building design complies with WCC 10.48.080(4) Architectural Scale requirements as follows:

(a) Building Articulation: Facades facing Washington and Elliot Streets are varied with windows and architectural elements at intervals not exceeding 30'.
(b) Horizontal Building Modulation: Requirements are met by providing full-height changes in wall plane at a spaces of less than 30', window patterns, and offset roof forms. Multiple one-foot wall plane offsets are combined with a single fifty-foot offset, creating a pleasant, human-scaled rhythm along Washington Street. The one-foot offsets frame the main classroom windows and are shallow enough to allow the classrooms to remain as simple square or rectangular footprints. This simple footprint allows for maximum flexibility and functionality in classrooms that will house numerous age groups, teaching styles, and curriculums from year to year.
(c) Building Entrances: Main entrances to the building will incorporate entrance features (i) Porches protected by roof overhangs, and (ii) Wall material within the entry that is different and distinct from the material of the front façade. The two main south-facing entries have deep overhangs and accented panel siding to identify their location.
(d) The applicant requests that the deviation from the above article (c) modulation depth standard be approved as the intent of the standard is being met and functionality of the classrooms preserved.

Please consider this interpretation of the modulation requirements to WCC 10.48.080(4) Architectural Scale for the Washington Elementary School Replacement.

Respectfully,
TCF Architecture

Terrence T. Bills
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RH2 ENGINEERS PLANNERS SCIENTISTS

RH2 TECHNICAL

Memorandum

Client: TCF Architecture

Project: Washington Elementary School

Project File: TCF 214-079 **Project Manager:** Erik Howe, P.E.

Composed by: Patrick Lau, Staff Engineer

Reviewed by: Erik Howe, P.E., Project Manager

Subject: Washington Elementary School Turn Analysis

Date: October 07, 2014

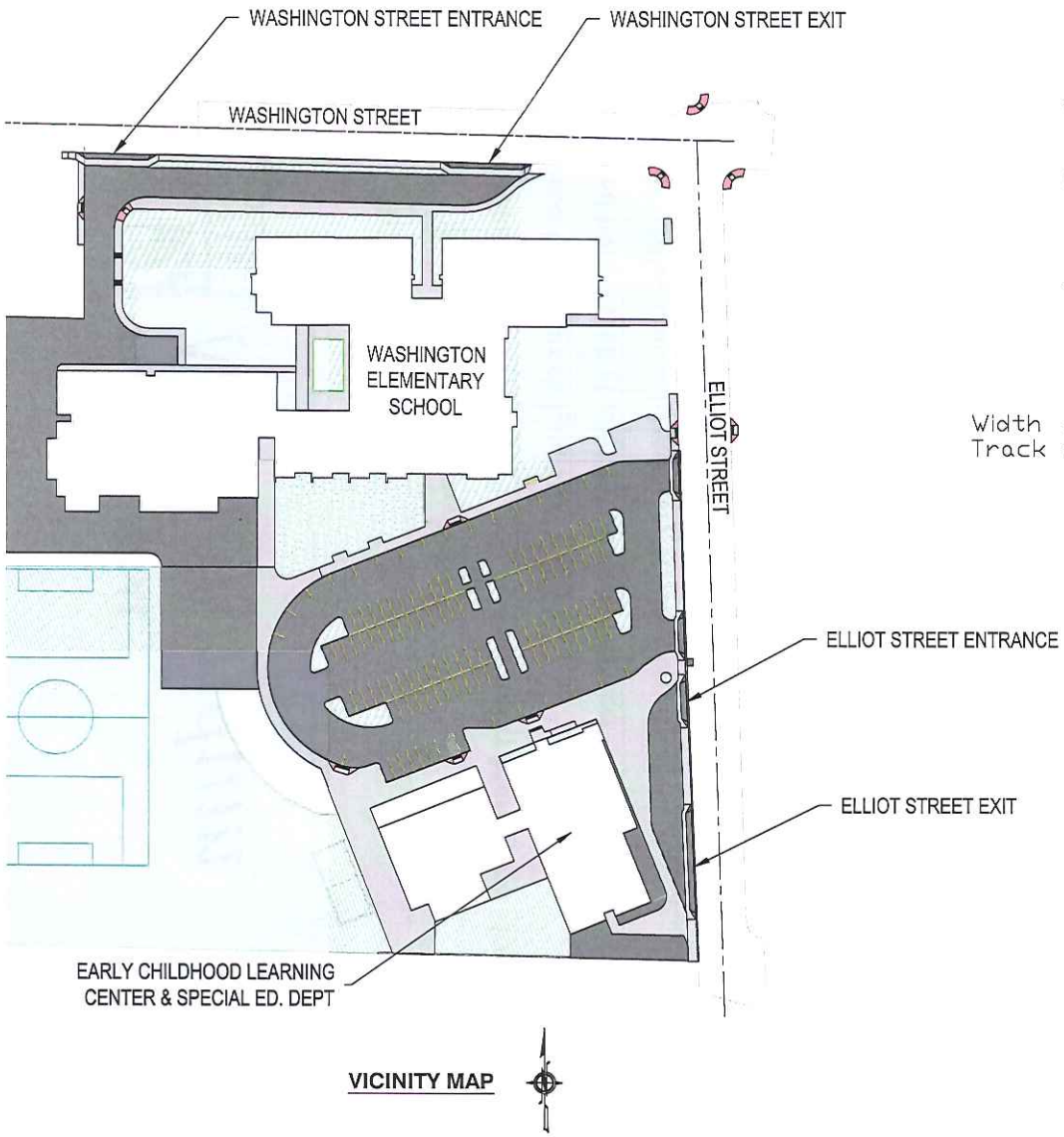
RH2 Engineering, Inc., (RH2) prepared this memorandum to document the required driveway widths to accommodate bus movements into and out of the Washington Elementary School driveways on Washington Street and Elliot Street in Wenatchee, Washington. The turn analysis was performed using Autodesk AutoTurn software to analyze sweeping paths of each turning movement for a 40-foot-long school bus. The analyses showed the need for 50-foot-wide driveway widths for both the entrance and exit driveways on Washington Street. Turning paths were also considered for westbound buses entering the driveway, however, this movement required an unreasonable amount of space to maneuver and is not recommended. The Washington Street entrance and exit driveways will be designed as a pull-through type driveway for eastbound buses. The bus pull-through type driveway adjacent to Elliot Street required a 30-foot-wide entrance (to the north) and a 50-foot-wide exit (to the south), as indicated by the auto turn analysis. However, the current plans from TCF architecture show an 80-foot-wide driveway. This additional width will further enhance the bus drivers' ability to exit onto Elliot St.

The Elliot Street parking lot has 25-foot-wide entrance and exit ramps not intended for buses and was not reviewed for this memo.

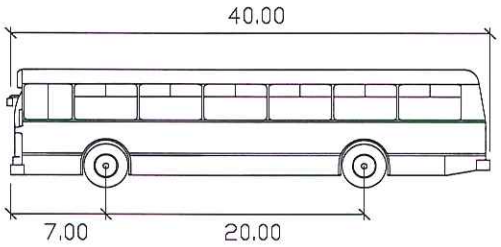
The sweeping paths generated from the AutoTurn software and are provided in the attached exhibit packet. The proposed driveways were sized to eliminate off-tracking over the driveway wings or curbs during the turning movement.

Attachments

1) AutoTurn Turning Exhibit Packet



VICINITY MAP



S-BUS-40
feet

Width : 8.00
Track : 8.00

Lock to Lock Time : 6.0
Steering Angle : 34.4

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Project Title
WASHINGTON ELEMENTARY SCHOOL REPLACEMENT

WENATCHEE, WASHINGTON

Project Numbers
2014-001

Issue & Revision Dates

24 JULY 2014	50% SD
4 AUGUST 2014	SD COST ESTIMATE
20 AUGUST 2014	100% SD
10 OCTOBER 2014	30% DD
13 OCTOBER 2014	CUP

PRELIMINARY
NOT FOR CONSTRUCTION

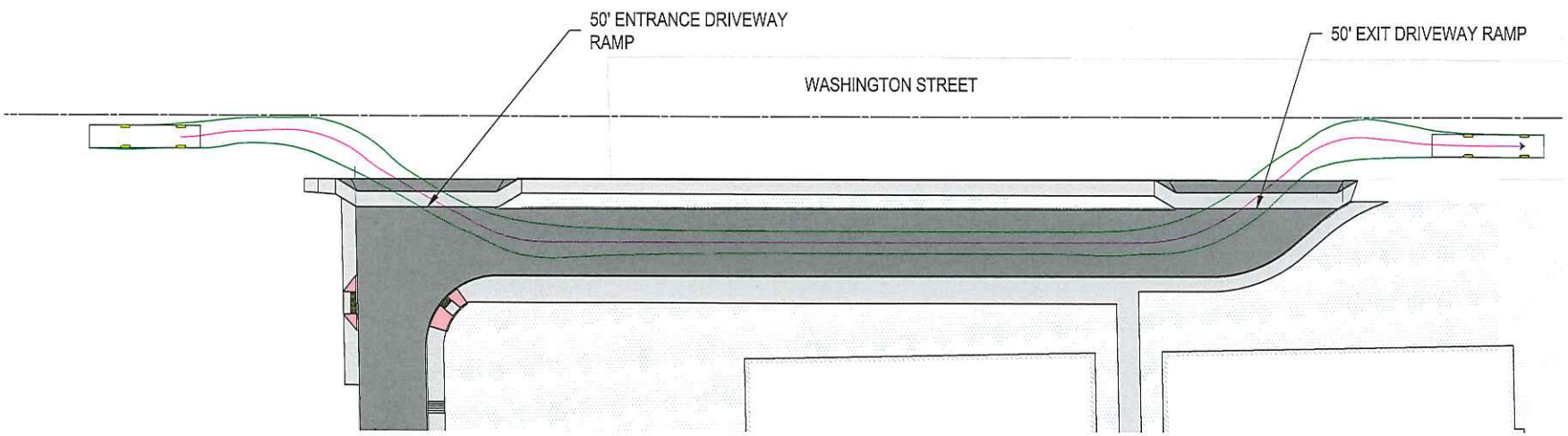
Sheet Title
AUTOTURN 01

Drawn By PGL
Checked By EH

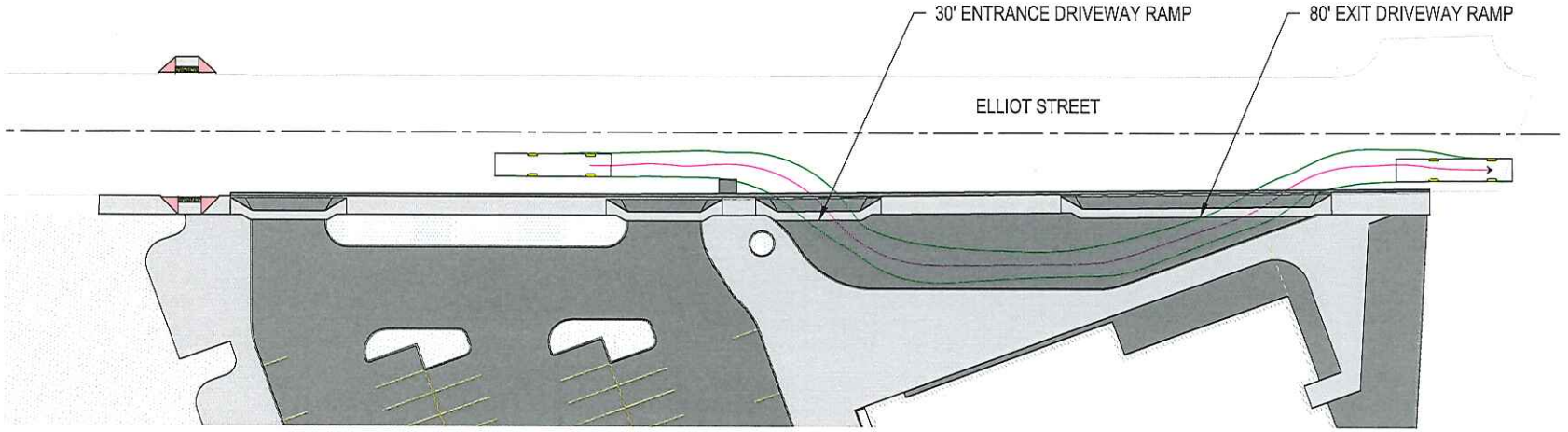
Sheet Number
AT01

Sheet Number ____ Of ____

ES:X AUTOTURN.DWG
SAVE DATE: Oct 16, 2014 PLOT DATE: Oct 16, 2014



WASHINGTON STREET PULL-THROUGH



ELLIOT STREET PULL-THROUGH

CITY OF WENATCHEE
OCT 22 2014

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PRELIMINARY
NOT FOR CONSTRUCTION

Sheet Title
AUTOTURN 02

SCALE: 1" = 20'
0" 0.5" 1"
DRAWING IS FULL SCALE WHEN BAR MEASURES 1"

Drawn By PGL
Checked By EH

Sheet Number
AT02

Sheet Number ____ Of ____

ES X AUTOTURN.DWG
SAVE DATE Oct 16, 2014 PLOT DATE Oct 16, 2014